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IT HAS BEEN WELL SAID that the nation which lacks vision must surely perish. With equal truth it may be said that no industry, however great, can afford to let success blind it to the need of looking well into the future and adequately planning to conserve the primary source of all its wealth, namely, that which yields its raw material and to which everything else must prove of secondary account.

The best informed are confident that the rubber industry will expand indefinitely and long be spared anything approximating a crisis; yet if its position is to be made impregnable, regard must be paid not merely to bettering its fiscal affairs, enhancing the efficiency of its workers, improving its processes, and increasing its output, but it must give greater attention than ever to the production of crude gum; not only by extending plantation areas, but also by taking every precaution to preclude the possibility of crop failure, a lessened yield, or latex quality deterioration, whether due to soil exhaustion, climatic changes, or plant diseases.

All this is but prefatory to hearty commendation of

an appeal which is being made to rubber manufacturers throughout the world by the Imperial College of Science and Technology, South Kensington, London, for the support of the Botanical Section of its Department of Biology, and which appeal has recently received vigorous indorsement and substantial support from the Council of the Rubber Growers' Association of England, alined with which are the owners of the largest rubber plantations in the world. These far-sighted business men keenly realize how such an institution can carry on much better than any they might establish among themselves, exhaustive research in rubber plant diseases, bio-chemical problems in utilizing tropical flora, bacteriology of soil, plant breeding, and allied subjects of pressing concern to growers and consumers of tropical produce. The British Government contributes generously to the cost of this practical scientific work, but the expense of maintaining such research, keeping up great laboratories, and training numerous students willing to devote their lives to the betterment of the rubber industry quite overtakes the resources of the famous college.

Apart from the fact that the question of improving rubber conditions at their source is of direct and pecuniary advantage to them, and that the college is ideally fitted for conducting research and worthy of most liberal encouragement, American manufacturers are in this instance afforded an opportunity to show their appreciation of unique and important consideration. Not only are they mindful of the valuable pioneer work of English rubber planters, and well do they realize that this country is greatly dependent upon English enterprise for its supply of raw rubber, and that in aiding the college named and cooperating with the rubber growers overseas they are but helping American industry, but they also do not forget that during the Great War, when production in this country in so many other lines was halted or retarded through inability to import raw material, the rubber manufacturers of the United States knew no shortage of material, having been directly favored with an abundant, unfailing supply of crude gum sold to them at the low, pre-war prices, even though the cost of everything else was sky-rocketing.

NO SLUMP IN SIGHT.

THE MIDSUMMER DULLNESS, with its vacations, a few shut downs and a certain slackening in orders, in the light of the needs of the country does not for a moment argue a general depression in the rubber business. As the Goodrich company points out, the automobile and motor truck business is due to continue its demand for tires and that in increasing proportions. So, too, the United States Rubber Co. predicts a footwear business for next year fully 40 per cent greater than that of the present year. In addition to this is the

vast new railway equipment needed for railroads in all of which the mechanical goods companies share. Truly, instead of gloom, the prevalent attitude in rubber should be most optimistic.

PROFIT-SHARING, PIECE WORK AND BONUSES.

HARASSED with pleas for higher wages and shorter working time, and menaced with direct or covert threats of strikes, many a rubber concern, operating perhaps on a narrow margin of profit and against keen competition, is often sorely puzzled as to how best to placate discontented operatives. To raise the wage scale without being able to increase the selling price of the products, much less to reduce the working time while advancing the fixed pay, may mean flirting with failure. Finally, to the distracted concern casting about for a solution for the vexing problem the profit-sharing plan is suggested as a "happy compromise"; and the managers, like the drowning man who clutches even at a straw, seize upon the plan. If it be accepted by the employees the managers flatter themselves on their good fortune in thus composing the disgruntled and averting an impending disaster. Yet what they really do is to administer to themselves and their employees a Lethean draught to make them for the time being forget their mutual troubles, while blindly trusting to the morrow to supply the deficiencies of the present day.

Because in some favorable instances the profit-sharing scheme has been a success, that does not alter the fact that it is unscientific and cannot be applied efficiently in a wide variety of cases. For a concern to virtually agree not only to maintain a certain scale of wages, but also to distribute regularly a generous share of profits to its employees, means assuming an obligation that is often very difficult to discharge. Unforeseen circumstances may make such profit smaller than the employees had been led to expect, or it may disappear altogether, arousing suspicion and ill-feeling among the workers. Setbacks come to even well-directed concerns; and statistics remind us that but one out of five business ventures proves a money-making enterprise. Hence, when the share of profit fails to materialize it may be hard to convince the disappointed workers that they have not been tricked. Stockholders, accustomed to business reverses, may resign themselves meekly to the passing or reduction of a dividend; but impractical employees, who waived their demand for more pay and accepted the will-o'-the-wisp of profit-sharing, may angrily renew their claims, and the last state of the temporizing employer may be worse than the first.

Even though some profits be declared, the ardor of the zealous, ambitious worker is sooner or later chilled by the indifference of the lazy or incompetent worker

who shares equally in the awards, and he either lapses into the humdrum of mediocrity or goes elsewhere to better himself. While the wage system will linger long with us, and while in some forms of employment it is neither feasible nor desirable to supplant it with any other form of compensation, yet for a great many industries a much more elastic system has been found advisable to add zest to work. Such procedure is to pay men for what they actually do in quantity and quality, and not a portion of profits that some one else may have won for them through good fortune or through rare managerial skill. A close approximation to this is seen in the piece-work system that obtains in some of the largest rubber factories in the country, and which mode of rewarding industry provides an unfailing incentive to speed up and increase production, while tending to disarm distrust and lessen friction between employer and employed.

The second largest steel producing concern in America, employing over 100,000 men, rejected the profit-sharing system as too vague and uncertain and installed the wage and premium plan instead with striking success. Not only are the workers assured of a fixed daily allowance, but they also receive a bonus for everything done beyond a specific minimum amount. No man is too high or too low to benefit by this plan; and even where a relatively small amount of manual labor enters into a task, a man gets extra compensation for what he saves in fuel or other commodities, or for devising time- and labor-saving processes. It means maintaining a very complete cost system, but the investment yields a good return. Best of all, it pleases the worker to be paid fairly and quickly for personal, individual service, and for every extra effort he puts forth, instead of having to wait a long time for possible "profits." Perhaps this is the reason why this concern did not have to close its mills for even a day during the big steel-workers' strike last fall.

HAS THE FIBER SOLE ENEMIES?

THERE IS NO QUESTION that the rubber fiber sole found many friends among the wearers of medium priced shoes. This for the very good reason that it outwore two or three leather soles. Complaint is beginning to be heard that it is not so easily obtainable as it was in the past, that retailers and repair men often do not now stock it. One suggested reason is that repairers do not desire their work to last too long. Another is that the leather sole men are quietly fighting the fiber sole as jeopardizing their business. It is probable that neither of these conditions prevails to any great extent. Furthermore, were such conditions prevalent, they would be, if merely taken advantage of, an ideal background for a big drive in fiber soles.

Possibilities of the Peachey Process.

IN CONSIDERING an invention that appears to be revolutionary it is interesting and always well to know the source. The inventor of the Peachey process, S. J. Peachey, is a well-known English chemist, who since 1902 has been lecturer in chemistry in the Manchester College of Technology and lecturer also in the faculty of technology of the University. For many years he has devoted much attention to rubber, has produced a number of valuable compounds and has done much toward the development of accelerators.

BRIEF OF THE PROCESS AND GASES.

The process, briefly, is the exposure of rubber compounded or pure in sheet form without sulphur, exposed first to sulphur dioxide gas, followed by exposure to hydrogen sulphide gas, all without heat; or saturation of rubber solution with the same gases. Sulphur dioxide, one of several oxides of sulphur, is a colorless gas resulting from the burning of sulphur. It was first obtained in the pure state and recognized by Priestley in 1775. It occurs in nature in the gas issuing from volcanoes and in solution in waters of some springs. Enormous quantities of sulphur dioxide are used in the manufacture of sulphuric acid by the combustion of sulphur or a metallic sulphide.

Sulphur dioxide is colorless and has the peculiar irritating odor observed when sulphur is burned. It is 2.2 times heavier than air and under standard conditions one volume of water dissolves about 80 volumes of the gas. It is easily liquefied, a freezing mixture of ice and salt being sufficient to effect condensation under atmospheric pressure. The resulting liquid is colorless and is a commercial product, being stored in strong glass syphon bottles or metal containers.

Hydrogen sulphide is a colorless gas of very offensive odor, familiar as the odor of rotten eggs. It is 1.18 times as heavy as air and may be readily condensed to a colorless liquid. One volume of water at ordinary temperature dissolves three volumes of the gas, which may be expelled completely by boiling. In pure form the gas acts as a violent poison and even when diluted largely with air produces headache, dizziness and nausea. Fortunately its extremely disagreeable odor gives warning of its presence. It is not an article of commerce but may readily be prepared by the action of hydrochloric acid on iron sulphide and may be stored in glass or metal containers.

PRECURSOR OF VULCANIZATION IMPROVEMENT.

No doubt the Peachey process is of value, of great value, but it is probably not the last word in this line of vulcanization. Just as aniline came into use as an accelerator and was later dispossessed by other better catalyzers, so will the dual gases be superseded by compounds, liquid, solid and gaseous, that will produce vulcanization within the rubber compound and be so graded and governed that exact time limits and varying results be accurately obtained. This is assured by the general interest in this line of work and the searching experiments that have long been carried on in many of the great rubber laboratories.

That curing by quick and high heats is often a detriment is freely conceded. Fabrics are certainly not improved; indeed certain of them are weakened. Animal substances like leather are burned unless specially prepared to withstand the heat and even then suffer a loss of original strength. Where the Peachey process is adaptable, therefore, fabrics and strengtheners of all sorts may be expected to preserve their original integrity.

The possibility of getting rid of chloride of sulphur and bisulphide of carbon will appeal to those who use the cold

cure. To be sure, through modern safeguards the ill effects of both the solvent and curative agent are guarded against, but neither are pleasant ingredients either in store or in use.

Of the claims to superiority in result some attract instant attention and some do not. The claim that porosity will be much lessened is doubtless sound, but with a very definite knowledge of the cause of porosity, both chemical and mechanical, the evil is rarely present. Anti-porous ingredients and the pressure cure make gas bubbles almost an impossibility even in the greenest of stocks.

ON THE RELATIVE IMPORTANCE OF COLORS.

The importance of color or shades of color in soft rubber goods is generally overestimated. In ninety-eight per cent of the manufactured product it is of absolutely no importance. A very little reflection will make it evident that pink belting, robin's-egg blue wire covering, old-rose valves, or Titian truck tires would be of no interest to users. Not only is this true in mechanical lines, but in footwear and clothing as well, where the bulk of the product will always be black by preference. Furthermore, in all of the important lines where reds, tans, blues or whites are demanded they are successfully produced at reasonable cost. In druggists' sundries and notions, as bathing caps, color, however, is of value. Ten years ago the announcement that any desired shade could be obtained in rubber would have interested manufacturers exceedingly. Today, however, so great a variety of colored compounds is produced that the actual necessity does not exist. This does not mean that other shades would not be used if available, but the void of past years no longer exists.

However, in light rubber surfaced clothing, particularly for ladies' wear, there seems to be a considerable field. In the past some beautiful effects in color have been obtained, but with difficulty. Peachey's process, however, would seem to open the door to the production of a great variety of colors, shades and effects rivaling the finest fabrics, and such as would appeal irresistibly to the decorative sex.

In toy balls also, solid colors in cheap compounds would obviate the necessity of painting the surfaces. It is quite probable further that balloon fabrics colored to resist the effect of sunlight might be more effective than under existing methods.

In the cases of dipped goods and spreader goods when cured by acid or vapor, manufacturers may and doubtless will find in the new process a surer way of securing a greater variety of colors than at present and it is in those lines that a considerable development is probable.

An advantage would seem to lie in the complete vulcanization that the process insures, something that neither the hot process nor the sulphur chloride cure accomplishes. Another is the freedom from efflorescence of sulphur (bloom) on the surface of finished goods.

CURING METHODS CONJECTURED.

Just how one would cure rubber goods by the Peachey process is a very interesting subject upon which to speculate. In spreader work, for example, the gas impregnated compound would be applied as usual. The first coat as soon as the solvent was evaporated would, unless we err, at once cure itself. The second coat would therefore be spread upon a coating already vulcanized. Not that this would matter probably, but it is a bit startling. Or the goods could be spread with the ordinary compound minus the sulphur and exposed to the action of the gases in an ordinary dry heater,

without the heat, however. This naturally brings up the question as to whether all dry heat goods can be thus treated, carriage cloth, clothing, blankets and the like, and the answer sounds like yes.

Still considering dry heat processes, may boots and shoes be thus cured? Granting that the new process brings about a very dense condition in the finished product, is the result likely to be as good as that obtained by the pressure cure now generally used in footwear manufacture? If so, are the big old-time dry heaters, minus their heating equipment, likely to come into vogue again? The question of finish, of course, will be important. Footwear is a varnished product and it is likely that a coating of boiled oil varnish on the outside of a shoe would keep the sulphur gases out. That, however, is not important, as a Peachey process varnish could doubtless be added that would be more elastic and brilliant than one made of linseed oil.

TOUCHING NEW COMPOUNDING INGREDIENTS.

It is in the line of new applications of rubber and its wider use of new compounding ingredients, however, that one is minded to investigate.

The fact that the process is one that is free from the destructive influence of heat opens up many new compounding possibilities. Organic substances have been used with difficulty in rubber compounding in the past. Today, glue is about the only one that is largely used, and that took much careful experimentation before it was a success. The right kind of cold process, however, would admit the use of almost any kind of gelatin, animal or vegetable, of which the seaweed gelatines are the most interesting. There is also the possibility of the incorporation of such animal products as dried milk and casein. Indeed the utilization of almost any kind of dried animal refuse would seem to be feasible. Although the gases in themselves are not particularly pleasant, the process would seem to admit of the use of a great variety of essential oils and perfumes that would not only do away with the smell of the vulcanizing ingredients but would impart a pleasant odor heretofore difficult to obtain in manufactured rubber goods. As a case in point, Chinese rubber shoes with a distinct odor of sandal wood would doubtless find a ready market in the Flowery Kingdom.

ON THE USE OF VARIOUS PRODUCTS.

There is also an opening for the utilization of a variety of vegetable fibers not heretofore used because injured by heat. Thus there would be nothing to prevent the use of wool shoddy, bristles, horsehair or cowhair.

Speaking of vegetable products, the flours of rice, barley, rye, oats and wheat, once the prices come down, might make good compounds. Indeed a very little of the cold process rubber added to the macaroni compound would produce white tubing comparable to some of that which today appears in the open market.

The inventor has already mentioned the field now occupied by the products known as linoleums. There is no doubt that rubber as a binding material is infinitely superior to oxidized linseed oil. If in addition it is self-vulcanizing, the product that should be produced would be much more durable and at much less cost. Furthermore, the same conditions should apply to table and shelf oilcloth.

It is in the line of repairs, particularly in rubber factories, that some such process should have its first development. In spite of constant inspection, goods that are defective are often scrapped. This is largely because they will not stand revulcanization without burning. A filler that will thoroughly vulcanize applied to a damaged section would, therefore, be of the greatest value. So too in the line of general repairs of all sorts. Such a jelly would find a very general use.

RUBBER GLUE POSSIBLE.

It is a well-known fact that the leather shoe manufacturers are very large users of rubber cements. These cements are used more for their waterproofing qualities than for holding. A channel cement that would be self-vulcanizing and thus add to the strength of the shoe would be a step in advance.

The glues, animal and fish, have long been in a class by themselves as adhesives and for sizing. A rubber cement that is self-vulcanizing is likely to find a field that will seriously crowd glue. In holding veneers, in book-binding, in many lines where waterproof qualities and a degree of elasticity are of value, rubber glue should be far superior to the organic product.

POSSIBILITIES OF COLD PROCESS HARD RUBBER.

There is no suggestion that the Peachey process produces hard rubber. On the other hand, with the investigations and experiments that are toward a self-vulcanizing compound that turns itself into ebonite will one day appear. When it does it will occupy a large part of the field now held by such products as celluloid and galalith. Accustomed as we are to only two or three colors in vulcanite, it is difficult to appreciate the tremendous field for hard rubber goods once they can be made in all colors and shades without overloading with detrimental pigments. Sufficient to say that a cold process like Peachey's applied successfully to hard rubber would produce ornaments in jade, amber, tortoise shell and the like, infinitely superior to any celluloid or casein products. While in lacquers, elastic varnishes and japan, rubber would have the field all to itself.

The possibility of a pure white hard or semi-hard rubber leads the thought at once to pottery. The fragile plates, cups and saucers are a constant source of trouble and expense, particularly in hotels and on shipboard. The cost of breakage alone is very great. A semi-hard white, odorless and strong dish would be a boon and it is not an impossibility.

We are minded here to speak again of hard rubber wood, the production of which would be immensely hastened by cold process vulcanization. Hard rubber wood is coming anyway and fortunately is not dependent on revolutionary processes.

Vulcanized fiber is a product that is very important in the arts, large factories being employed in producing it. The one troublesome quality of the material is that it absorbs moisture. To counteract this it is shellacked and surface treated. An analogous product containing a very little self-vulcanizing rubber would doubtless drive the old time fiber out of this market.

SUGGESTS RUBBER IN PAPER MAKING.

Rubber has in times past been tried in paper manufacture. Its high cost and the necessity for hot vulcanization rendered it of no value, however. Today, with cheap rubber and a cold process that does not injure fiber nor discolor, there are possibilities of rubber as a pulp binder finding a new and wider field of usefulness. It is likely also that many fibers heretofore useless might become valuable. Paper makers say that paper that crackles is not looked upon with favor and is unsalable. Possibly a little rubber in the harsh pulp might correct this evil. However this may be, a certain amount of rubber would greatly strengthen any paper; a sufficient portion would render it not only tough, but waterproof as well. And this applies not only to book and wrapping papers, but to wall papers and tapestries.

Furthermore, paper boxes, bottles, containers and cartons, cigar boxes, paper plates and scores of other paper products are likely to be made more sanitary and useful by this binder. It is also entirely possible that the Peachey process may be the necessary touch to make German paper clothing a success. Even today hundreds of Englishmen are wearing

German paper suits. The suits wear about a week. A rubber binder that in no way affects the color, that makes the product practically waterproof and more flexible, may bring the product into permanent competition with cotton, wool and silk wearing apparel. And speaking of silk, is not this addition just what is needed to bring artificial silk a bit closer in lasting quality to nature's product?

IMPROVED RUBBER THREAD.

Among the lines of manufacture that suggest themselves as being revolutionized by this or an analogous process one might cite rubber thread. This product as made today shows a square end in cross-section. A stretched rubber thread when it begins to give away shows a multitude of tears along the sharp edges. A round thread would not be open to this objection. Harking back to the beginnings of rubber thread, it was once made round by forcing rubber in solution through metal dies. Had the rubber dough been self-vulcanizing it is doubtful if the square thread ever would have appeared.

THE QUESTION OF MASS VULCANIZATION.

The possibility of making molded goods by this process is already engaging considerable attention. For these articles molds or forms of almost any material could be used, plaster of Paris, for example. It is likely that molds of porous material might find use. These have already been suggested by the inventor. For thick articles, however, they would hardly do. The reason is that in the vulcanization by mass there must be opportunity for the liquids to escape. It would be much like coagulation of rubber latex. If done in mass, water is imprisoned and unless sheeted it is held in the interior. In the same way a mass of rubber vulcanized by the Peachey process would inevitably contain water, and if solvent was used, much of it would be imprisoned. As to porous molds carrying this off, when earthen plates were tried for coagulating latex only the surface moisture was absorbed.

The statement is made that buffers (springs) may be made in layers, each vulcanizing itself in turn, adhesion between the layers being obtained by Peachey process cement. This is possible, and it is also possible that solid tires may be made by a similar building up process.

THE UNKNOWN EFFECT ON RECLAIMS.

A question of considerable moment upon which no light is yet thrown, is the behavior of the new process toward reclaimed rubber. So far no one seems to know just what results will be obtained, particularly in the medium and lower grades of reclaim. As fully as many pounds of recovered rubber are used as of crude, it is naturally one of the first of the queries that manufacturers put.

RUBBER MEN WILL DISCUSS SAFETY PROBLEMS.

The Rubber Section of the National Safety Council will consider safety problems of especial interest to the industry at a section conference to be held September 29 to October 1, in connection with the national session of the Council to be held at Chicago.

Among the topics for discussion will be: "The Present and Future of Safety in the Rubber Industry," chairman, S. M. Schott, United States Tire Co.; "Health Hazards," J. H. Horan, Hood Rubber Co.; "Making Mills and Calenders Safe," C. B. Mutchella, The B. F. Goodrich Co.; "Handling Materials," F. B. Martens, Firestone Tire & Rubber Co.; "Vulcanizing Apparatus," F. Scott, Hamlin & Co.; "Industrial Sanitation," W. N. Fitch, The B. F. Goodrich Co.; and "Teaching Safety in the Factories," H. T. Martin, The Fisk Rubber Co. An address will be made by J. N. Gunn, president of the United States Tire Co., on the opening day of the section meeting, and by A. A. Frank, factory manager of the Federal Rubber Co., on the last day.

EXPORTS OF INDIA RUBBER MANUFACTURES FROM THE UNITED STATES DURING THE CALENDAR YEAR 1919.

THE ANNOUNCEMENT of the United States Government that henceforth all tables of import and export statistics shall be for the calendar instead of the fiscal year ending June 30 as heretofore seems to be a step in the right direction. At any rate, it greatly clarifies such tables and permits a much simpler analysis and comparison for the layman, to whom "double-barrelled" year numerals like 1916-17 or 1917-18 were often a source of confusion.

Of much interest is the recently published table of exports of india rubber manufactures from the United States during the calendar year 1919, printed elsewhere in this issue. The total value, \$53,865,655, as against \$31,501,292 in the calendar year 1918 is proof positive to the rubber manufacturer that business is "picking up." Any business that nearly doubles itself in the space of a year is a good one to be engaged in. A comparison of the 1919 figures with the small export of \$12,441,220 during the year before the war (1913-1914) shows the progress made by the rubber industry of the United States in foreign markets.

By countries the report is just as encouraging. The exports of automobile tires rose to \$28,924,659 (more than half of the total rubber exports, by the way) as against \$14,511,621 for the calendar year 1918. Of these, \$11,907,480 went to Europe; \$2,970,464 to Asia; \$4,986,024 to our neighbor South America; \$3,872,374 to Oceania and Africa; while \$5,188,317 stayed near home, being exported to other places in North America. Cuba took \$2,013,071, while Canada called for \$1,021,014. Of tire exports to South America Argentina leads with \$1,788,147, with Brazil second at \$1,018,055. France took nearly a third of the tire exports to Europe, \$3,535,178; England bought \$1,508,460; Sweden, \$1,373,847, and Denmark, \$1,254,324, with the Netherlands not far behind at \$1,043,981.

Exports of tires to the Philippines totaled \$1,372,544, while New Zealand took \$1,023,807. The largest consumer of American tires in Asia during 1919 was the Dutch East Indies with \$686,873, while British South Africa led that continent with \$479,934.

The rubber shoe export rose from \$1,584,747 in the calendar year 1918 to \$4,551,386 in 1919, while rubber boots showed a decided fall—from \$2,799,116 in 1918 to \$714,713 in 1919. This is explained by the large exports to Europe where boots were needed during the war, while shoes are now in demand.

Exports of belting, hose and packing showed a considerable increase from the previous year, the amount in 1919 being \$6,100,460 as against \$4,525,243 in 1918.

Druggists' rubber sundries, which were not specifically reported before 1917-18, showed a gratifying increase; while in 1918 the figures were \$772,539, the amount nearly doubled the following year, being \$1,270,506 for the calendar year 1919.

Rubber scrap exportations increased very largely over the preceding year, the figures being \$808,993 in 1919 and \$287,883 in 1918. Reclaimed rubber also showed an increase, from \$502,176 in 1918 to \$839,938 in 1919.

COLLAPSIBLE PLAYING BALL.

A collapsible playing ball is a novelty on the market. Made entirely of cemented rubber, it may be inflated by blowing through the specially constructed aortic valve. As soon as the action ceases, the pressure inside causes a perfect automatic closure of the valve. When the player has finished, he inserts a rod or pencil, thus opening the valve and allowing the air to rush out. The empty ball may then be folded in any suitable manner, and carried without being in the way. (French patent No. 138,306. Boguier & Burnet, 21-23 rue des Filles du Calvaire, Paris.)

Tire Bead Manufacture.

By Robert C. Kelley, A. B.

It is an old axiom among rubber men that their merchandise is only as good as its weakest part; thus, the tiny pin-hole makes the whole inner tube useless, and the started sole makes the rubber shoe a second. This is particularly true of the automobile tire—a tough tread with a good non-skid design, the best Sea Island cotton frictioned with 95 per cent Pará, and a strong side wall will not give the mileage if the bead construction is faulty.

Bead making, while not involving any complicated processes or highly skilled workmanship, is nevertheless of enough importance to warrant a separate department for this work. Beads are divided into two classes, the straight-side bead and the clincher bead for demountable rims.

MAKING STRAIGHT-SIDE BEADS.

The straight-side bead is built up on a wheel the size of the tire, as here illustrated. This makes it necessary to have as part of the equipment a wheel which can be used interchangeably on the bead making machine for each size of tire. This wheel has the outer edge raised, forming a groove in which the bead is constructed in the following manner: first, a strip of frictioned cloth

about two or three inches wide, cut on the bias, is laid in the groove and stitched down with a plain hand stitcher or revolving wheel. Then several coats of cement are applied with a brush, and the strands of wire placed in the strip, twice around the wheel. On top of this as a covering are laid two plies of bead cord which comes in strips similar to cord fabric only of smaller staple cotton. The parts are then rolled together firmly by pressure of a hand roller on the revolving wheel.

The final operation before curing is to fold over the plies of fabric, completely covering the wire which is embedded in the center of the fabric. Great care must be taken to see that the wire is covered at all points, otherwise it will break through in the cure and spoil the bead. Spoiled or damaged beads are a total loss, as their hard, brittle texture and the presence of the wire make them valueless for reclaiming

purposes. In tire reclaiming one of the first operations is to cut out the bead.

The bead is cured in a circular mold in a hydraulic press for about seven to ten minutes and comes out in the form of a hoop. The overflow is trimmed off on a trimming machine, shown in the picture, and the beads are then inspected for breaks and defects due to faulty stock, poor making, curing, or trimming. Before passing to the tire maker the beads are dipped in a vat of specially prepared cement and hung on racks to dry, as here illustrated. This is to give the bead plenty of adhesion so that it will stick well to the plies of

*fabric which encompass it in the tire.

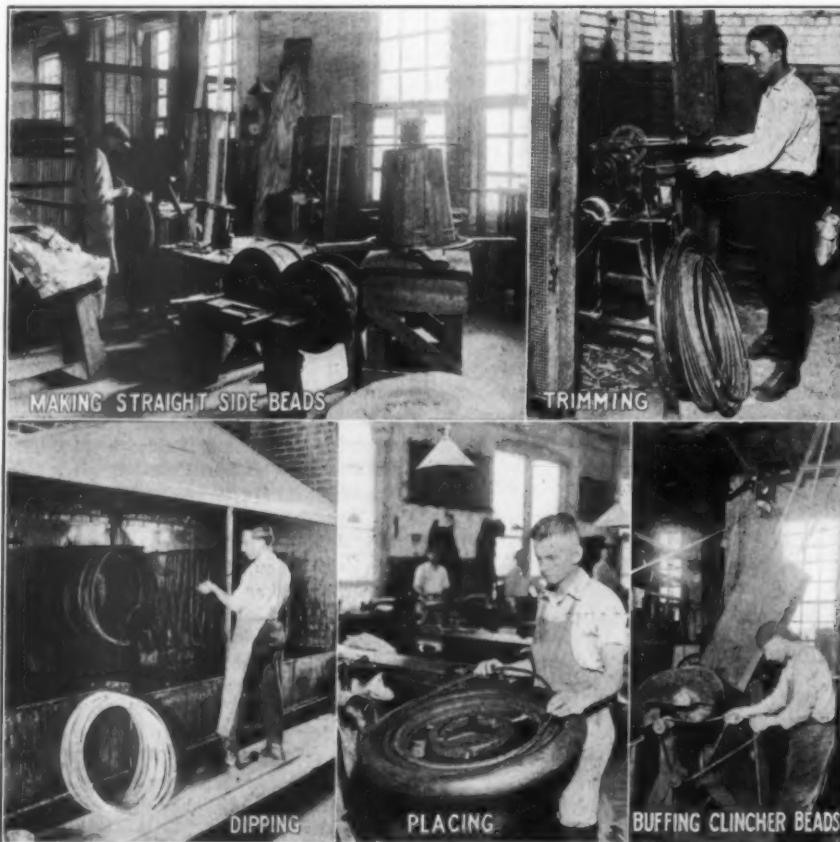
The bead now passes to the tire maker and is built into the tire as follows: the maker first places the iron core on his machine and starts the first ply of building fabric on the core in such a manner that it entirely covers it, the center line of ply following the center line of the core, allowing it to overlap the core evenly on both sides and applied with equal tension. He next manipulates the two mechanical stitchers, bending the plies into the under side of the core, forming ears in which the bead is placed within iron rings, which

are held in place by clamps. The picture shows a tire-maker placing the bead for a straight-side tire. The bead in position, the rings are removed and the bead thoroughly stitched down to secure proper and uniform adhesion. The bead is covered by a piece of friction known as the bead ply or reinforcement and encompassed by additional plies of fabric.

MAKING CLINCHER BEADS.

The clincher bead differs from the straight-side bead in that it has a core of hard rubber instead of wire and is more nearly circular in shape, whereas the straight-side bead is like a triangle with sharp edges. This core is mixed and compounded with a high percentage of sulphur to make it vulcanize hard.

The stock is warmed up and run either on an outsole calender with a roll specially engraved for this purpose or on a tubing machine. These long strips of uncured bead gum



BEAD MAKING IS OF SUFFICIENT IMPORTANCE TO REQUIRE A SEPARATE DEPARTMENT.

are first covered with a strip of friction, or, if uncovered, are buffed on a wire wheel to smooth off the rough edges, and placed in a spiral vulcanizing mold which is washed with liquid soap to prevent sticking to the mold. The cure varies from seven to ten minutes. The long strip is then removed from the mold and cut into lengths to make the size of bead desired. This must be carefully planned out before the beading is cured to avoid the waste of trimming, as the uncured trimmings can be used over again, whereas the cured ends have little scrap value. The ends of the bead are joined by splicing. This is done either in the bead department or by the tire-maker.

A clincher bead being buffed is shown herewith. Clincher beads are more flexible than straight-side beads, although they harden up in the second cure with the tire. The difference between the two types is seen in the illustration, where straight-side beads are hanging on the left-hand racks and clincher beads on the right, after dipping.

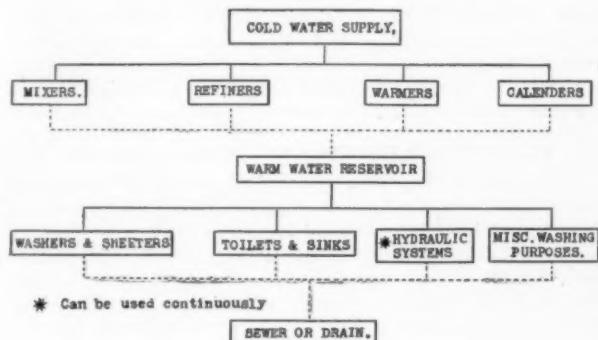
While methods differ in various plants, this article describes the processes of bead making generally followed in the tire industry today.

WATER REQUIREMENTS FOR RUBBER MILLS.

By Walter J. Bitterlich.

IN THE MANUFACTURE of rubber products, temperatures are of prime importance. Rapid changes as well as uniform and even temperatures are required and obtained largely by the use of water, steam, and air. Uniform temperatures cannot be maintained with water, or air unless they are circulated. This is apparent while in bathing, when different currents are met with, some cold and some warm; also in a bath tub when the water is too cold and hot water is added, it is necessary to stir it up in order to make it uniform.

Owing to the tremendous amount of water used, economy is practiced by its reuse and the equipment requiring cold and warm water should be laid out, graphically, as follows:



GRAPH SHOWING WATER INSTALLATION FOR MILLS AND CALENDERS.

The above illustration shows how water economy can be accomplished, but no attempt has been made to show pumping arrangement because each plant has different conditions and the system should be designed for the conditions as they exist.

The amount of water used daily in rubber plants varies from 100,000 to 3,000,000 gallons per day, depending on the capacity of the mill. When water rates are low, its reuse is not always worth the investment in pumping and pressure tank equipment, but where water costs from 75 cents to \$1 per 1,000 cubic feet, the investment is saved in a very short time. If artesian wells are not available with cold water below 60 degrees F., the municipal supply is used, and this varies in the summer months from 70 degrees to 75 degrees F. Then it is necessary to increase the

velocity of the water to obtain quick changes in temperatures of mill and calender rolls, and consequently more water is used. Its reuse in this event should be given consideration, otherwise the water bill will be high.

In laying out the local water and steam supply for both the mills and calenders, the returns should always flow by gravity and not discharge up to the ceiling of the room. The reason for the former is because a roll will never be more than half full of water after the valve is closed and when a quick change to warm up the roll is necessary, only a half roll of water will have to be discharged, whereas, if return is up, a full roll will have to be discharged and double the amount of steam will be required to accomplish it.

Not only is there economy in gravity flow but more important is the uniform temperature that can be maintained on the surface of the calender or mill roll because when the roll has become hot and is full of water it is desired to cool it during shutdown by circulating cold water, the upper half of the roll will be warm and the lower half cold. This is because the cooling water entering and returning through the pipe in the center of the roll short circuits and the hot water remains at the top of the roll.

A method of conserving the water supply in mills, which, by the way, use the greatest amount, is to install an open funnel at the return pipe of the mill roll. It will show at a glance the amount of water flowing through the roll, and if one mill is using more than another, it may be seen by the foreman who can order the valve regulated for its economical use. Of course, some stocks require lower roll temperatures and consequently more water, but the foreman should know this and be able to save much water.

WESTERN SALES MANAGER, C. KENYON CO., INC.

OSBORNE SMITH TWEEDY, who has been appointed western sales manager for the C. Kenyon Co., Inc., Brooklyn, New York, with headquarters at 223 West Jackson boulevard, Chicago, Illinois, was born in Buffalo, New York, in 1872.



O. S. TWEEDY.

Following his education in the grammar and high schools of that city he started in business in 1896 with the Eagle Iron Works. In 1888 he was appointed Buffalo branch manager for the Revere Rubber Co., following which he joined the Diamond Rubber Co. organization for a period of ten years, first in the credit department at Akron, and later as Chicago district manager. He then went to the Federal Rubber Co., Milwaukee, Wisconsin, as general sales manager, after two years going to the Continental Caoutchouc Co. in a similar capacity, and on its absorption by the United States Tire Co. was appointed assistant general sales manager of the latter company, followed in 1916 by promotion to general branch sales manager, from which office he resigned to join the Kenyon forces. He is also vice-president of the Dryden Rubber Co., Chicago.

This experience in tire merchandising, covering more than twenty years, and an extensive acquaintance in the trade, should be an invaluable asset in introducing Kenyon cord tires and tubes to the Middle West.

Mr. Tweedy is a member of various Masonic bodies, B. P. O. Elks, Chicago, Detroit and New York Athletic clubs, Siwanoy Country Club, Lambs' Club, and International Sporting Club.

Will Rubber Soles Successfully Replace Leather Soles?

A Discussion of Rubber and Fiberized Soles from New as Well as Old Angles.

By Chester C. Burnham.

MORE AND MORE am I convinced that the day is approaching when a material composed mainly of rubber and some fiber is going to be in quite general demand for the soles of shoes. Rubber manufacturers have made remarkable progress in the manufacture of fiberized soles during the past five years and it is interesting to note that progress and success seems to have been greatest with those who have studied the problems of product and market in the most thorough manner.

There is a profound need for intensive study of the subject of fiberized soles. It is a fact, which even a slight investigation will substantiate, that much of the "grief" experienced by early promoters of so-called "substitutes for leather" was brought upon themselves by an appalling lack of knowledge concerning the uses of the product they marketed. Millions of dollars for mold equipment and advertising were thrown away in a short time through snap judgments and short-sighted policies.

During the war, when sole leather prices went sky high, the fiber sole should have come into its own. By that, I mean to

It is no wonder then, that purchasers often wished for some sort of a rubber sole that would at least last the season through and in addition, furnish a clinging, flexible and waterproof sole the while. It must not be forgotten that this vacation footwear was exceedingly popular with many people as was attested by the enormous sales in spite of unreasonable wearing qualities. It was common for a shoe clerk to suggest to a complaining customer, the advisability of resoling the shoes with leather, although the shoes may not have been a month out of that store and invariably, such shoes were sold without a guaranty for reasonable wear of the soles.

With rubber soles possessing many known deficiencies and yet with an unlimited market in sight and only awaiting development, it is strange that the rubber manufacturers did not pay more heed to improving their products. That there was need for improvement is shown by the accompanying diagrams and even these changes were not thought desirable until after the appearance of fiberized soles. Had the fiberized product not been thought of, it is possible that we might yet be trying to market the old style soles and with the same lack of attention to the requirements of the trade.

But with the introduction of these new products, new uses were found for them and in responding to these new uses a closer study of the use and abuse of soles in the manufacturing as well as in the wearing of shoes was made.

Over night, as it were, rubber manufacturers came to realize that their rubber soles had offered many perplexing problems to the shoe manufacturer because of their varied mold styles. The early style molds resembled the dotted line diagram in Fig. 1, while the standard pattern which soon came into general use, resembled more closely the solid line pattern shown in the same figure. The soles had to be "rough-rounded" or rough trimmed, anyhow, and whereas there might be a slight waste in some patterns the waste was more than offset by the time saved in shifting molds in the press room, by the gain in production and by the ease for all parties to handle their stock room problems.

STANDARDIZED PATTERNS AND IMPROVED MOLDS.

The standardized patterns popularized themselves so quickly that no one thought to improve them further and thus other defects passed into the new mold equipment without notice. It had been thought necessary to have a sharp bevel or pitch to the breast of the sole at the point where the forepart thinned out into the shank. The thread on the sole stitching machines often broke when the machine presser foot came to these sharp rises or when it jumped off into space, and at other times the thread tension increased so suddenly that the soles were entirely cut through as one cuts cheese with a thread.

The first attempt to correct this trouble was in the line of lengthening this bevel. This was better, but trouble was still experienced when the presser-foot of the sole-stitching machine tried to climb up this pitch on one side and down on the other. No very satisfactory results were obtained until some one hit on the idea of making the "fadeaway" or undulating shank. With this type, the presser-foot gained and lost the tension gradually and allowed the automatic thread-controlling tension devices to operate properly.

Even with this improved mold the troubles were not ended, for it was soon found that when soles with heavy foreparts were attached to certain types of shoes, the shanks were often not heavy enough to stand the strain of the stitching and wearing

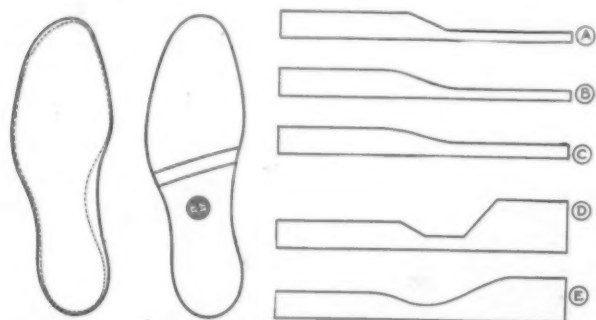


FIG. 1
DOTTED LINES
SHOW OLD
PATTERN.

FIG. 2
SHOWING OLD
STYLE BEVEL
SHANK TYPE
OF SOLE.

FIG. 3
SHOWING VARIOUS STAGES OF SHANK
DEVELOPMENT IN MOLD DESIGN.

say that economic conditions at that time were decidedly favorable to its introduction and sale in a large way. Unfortunately, obstacles were encountered, and in overcoming them at the start much was done to improve the product, but the expected heavy demands were not realized. How long it may take to regain this lost advantage is uncertain, but with the cattle supply of the entire world decreasing and with our domestic production of hides for sole leather falling off in an alarming manner, there is no question about there being a place for all the leather we can produce and also for a vast quantity of satisfactory fiberized rubber soles.

DEFECTS OF EARLY TYPES.

It is not difficult to recall the very earliest rubber soles that were manufactured. Some of us may not be altogether proud of them now, but we are prepared to admit that they were nearly all heavy, poorly designed for shoe factory manipulation and often composed of very little rubber and very many adulterants. Some you recall, had a very pungent odor which penetrated the insoles of the shoes and even the hose of the wearer and made frequent foot baths necessary. Be that as it may, their sale was large and on a type of foot-wear classified as "vacation shoes." Purchasers of this sort of footwear honestly expected the soles to crack across the ball or break away at the toe stitching long before the soles were worn through and often before the end of a short vacation season.

processes, and gave away. So once more new molds were designed, with the result that, now, nearly standard types are found in use among the most successful manufacturers.

Shapes.	Foreparts.	Shanks.
Men's	12 iron and 10½ iron.....	7 iron
Boys'	12 iron and 10½ iron.....	7 iron
Men's	14 iron	9 iron
Women's	9 iron	7 iron
Misses'		
Child's		
(An iron is equivalent to 1/48-inch.)		

In Fig. 3 we show a rough idea of these various shank changes in sketches *a*, *b*, and *c*, while in *d* and *e* we show the spring heel mold in the old and new designs. The reader can easily imagine how great was the improvement in this particular case. Some shoe manufacturers wanted spring-heel soles with varied heights of heels and thus we soon found on the market heels as high as ¾-inch. This necessitated the plying up of the heel portion of the blank used to fill the mold. It was later found much more practicable to make all spring-heel soles with heels ½-inch in height and then have the shoe manufacturer insert a wedge lift underneath the heel portion of the sole during the process of manufacture.

EFFECT OF POOR COMPOUNDS.

If rubber manufacturers were slow to improve their old molds and compounds, they were not so slow when it came to realizing the possibilities in the new fiberized product and in a short time there was not enough fiber of the proper kind obtainable nor were there sufficient fiberizing machines available to supply the demand for this material. In the crying need of the hour, with many fearing they would be outclassed by competitors, they were not so particular about the kind of fiber they got so long as they got it quickly and in sufficient quantities to enable them to flood the market with their products. Thus it came about that soles were soon on the market whose fibrous content might once have been leather refuse, hemp or jute rope, cork shavings and even grape packing, cotton waste, waste tire duck, silk fiber waste and even paper pulp—anything that could be reduced to a fibrous state quickly.

Of these over-night discoveries and compounds, some were remarkably good, while the vast majority of them reached an early grave. It was immediately recognized that the use of fiber in the soles gave them a much better bonding compound and stitchers in shoe factories found that they could now apply these soles in quantities without cutting the soles through in the stitching process. The fact that these fiberized soles were much lighter in weight was not overlooked and these facts together with their being better adapted to shoe-factory processes, led many to predict that they would soon replace leather.

These favorable points having been brought out through advertisements and trade press comment, the rubber manufacturers rushed to get their new compounds on the market, giving much time to quantity production problems but less attention to the needs of the shoe industry. This lack of diagnosis could but lead to unsatisfactory results and when these new products appeared from various makers they were of varied shapes, colors and thicknesses and not at all in conformity with the needs of the shoe manufacturers. Thousands and thousands of dollars that had hurriedly been invested in additional equipment for molds was wasted and more new equipment was necessary before the soles were fit for the market.

All this happened just prior to our entry into the great conflict and to give some idea of the demand for these soles at that time, it was reported that one large manufacturer was 400,000 pairs short of sales in September, 1915, and this in spite of a daily production of approximately 10,000 pairs. In six months his unfilled orders had almost reached the million pair mark and this in spite of increased production to about 17,000 pairs daily. But the war was on and sole leather had sky-rocketed in price. An economizing public was ready to substitute for leather and it was not long after this that the unfilled orders

of this same concern reached a goodly total of nearly 2,000,000 pairs. This is only one case and might be duplicated by several other large firms and imitated in lesser volume by many smaller firms.

AN IMPERFECT PRODUCT.

With all this apparent prosperity for manufacturers of fiberized soles and with the public acceptance practically assured, one hardly reckoned with the rude awakening that all were to get when it was found that many of the compounds failed to withstand the tests of time and every-day usage. Thousands of pairs of shoes were returned to the retailer—to the jobber—to the shoe manufacturer, because they failed in service. Other thousands which had not been applied to shoes were returned from the shoe factories to the rubber manufacturers. Realizing that rubber soles of the previous type had not always given serviceable wear, and anxious to put their new products "across" on the market, many enterprising sales managers had conceived the happy idea of guaranteeing their soles for wear, believing that this guaranty would decrease the sales resistance and make the product more acceptable with the consumer. Had they been sure of their product, all might have been well, but many tempted fate and the poorer compounds came rushing back by fast express and slow freight.

Very likely this was the best thing that could have happened, although it seemed at that time like a near calamity. Through all the disappointment, one fact sticks out clearly, however, and serves as indisputable proof that the process of rubber sole manufacture had undergone a change—a sufficient number of these new-born soles gave extraordinary wear and demonstrated that fiberized soles were extremely practical and worthy of further development.

THE NECESSITY OF IMPROVED COMPOUNDS AND METHODS.

With this fact pasted in their hats, a number of rubber chemists set to work and revised their formulas while others in the manufacturing line set about to study the varied needs of the shoe manufacturers. In this work they were aided by a prominent shoe machinery company, who are directly responsible for important changes in machines and parts used in the application and working of these soles on footwear.

It was learned that the tendency of rubber soles to stretch in wear must in some manner be greatly lessened and reduced to a minimum. Certain rubber ingredients were discarded as injurious to keeping qualities because investigation showed that soles were not often used as soon as received by the shoe manufacturer. Often they laid in the stock room for weeks and even if applied to shoes, the shoes might lie on the retailer's shelf for a season or more before finding an ultimate purchaser. In this way it was estimated that a proper sole should have keeping qualities for at least two years in addition to having wearing service after that time.

A large percentage of soles already marketed, trade-marked as well as unbranded, were unable to pass this test and realizing this, their makers dumped upon the market hundreds of thousands of pairs at a price said to average around 10 cents per pair and without removing or defacing the brands. Naturally this resulted in some of these soles being worn by the unsuspecting public and thus they were easily turned against a product that had not lived up to its advertised goodness and they promptly classified all such soles as unworthy of their patronage.

Such practices were not calculated to inspire confidence in the public mind and more especially at a time when every effort should have been made to restrict the circulation of undesirable merchandise. In fact, these failures threw a chill around the good as well as the bad soles with the result that a number of nationally known firms discontinued their lines and others who were about to launch a new product upon the market, profited by these experiences and indefinitely postponed its production.

ANNUAL REQUIREMENTS TWO HUNDRED MILLION PAIRS.

From the latest shoe manufacturers' directory we learn that there are about 1,000 manufacturers of shoes with a rated daily output of approximately 2,059,400 pairs of shoes. This total includes shoes of all kinds, many of which are not adapted for the use of fiberized soles. It seems fair to assume, however, that at least 50 per cent of this production might be adaptable to fiberized soles and thus we estimate a possible daily requirement of 1,029,700 pairs of fiberized soles.

Unfortunately the shoe industry is seldom able to keep employed at its full rated capacity and we must make further deductions in order to arrive at a fair estimate of the possible demand. It is fair to assume a working year of 200 days' production and we thus find that the total annual requirements of fiberized soles might be 205,940,000 pairs.

Assuming that the rubber manufacturer might desire to run his plant on a basis of 300 working days in the year, we find that this requirement would mean an average daily production of 686,466 pairs per day.

At an average price of 33 cents a pair, this would mean an annual volume of business amounting to \$67,960,200. The average price herein taken is a very low one and the reader will note that these figures do not take into consideration anything but the manufacture of new shoes. The repair trade will consume an enormous quantity of soles in addition to the above, and at a slightly increased price.

No actual statistics are available, but the production figures for fiberized soles today are stated by some to be around 25,000 pairs daily, which means that we are now supplying about 3½ per cent of the possible field. A business that has already reached a volume of \$2,500,000 yearly and which has a possibility of growth to thirty times that figure, should not be considered lightly, for, while the past five years were profitable ones in these specialized products, there is yet much work to be done.

Only a few retail shops make a reasonable showing of shoes with fiberized soles and when they do display them, their appearance does not always stand well by comparison with leather-soled footwear. A line here and there is the usual finding, but nothing like a complete line for men, women and children. Something must be done to bring this fiberized footwear into the class of its leather-soled brother and a brief discussion of some of the difficulties attending this will not be amiss at this time.

SUGGESTIONS TO SHOE MANUFACTURERS.

It is natural that having pursued the even tenor of their ways for decade after decade, shoe manufacturers should resent the suggestions of rubber manufacturers as to how shoes should be made. That, at least, is a fact, but it does not alter the other fact that the finish of a shoe often commends it to the purchaser. With the edges of fiberized soles left rough and unfinished on the shoes they can never be of prepossessing appearance. This matter of refinement in finish rests largely with the shoe manufacturer because it has been pretty clearly demonstrated that with a little greater care and slightly altered machine equipment or treatment, he can considerably improve the appearance of the fiberized soles on his lines of shoes. The manufacturers of shoe machinery have made the way comparatively easy by perfecting special machines and parts for these processes, but as they mean an increased investment in machinery they have not received the attention they should. The dominating factor in the matter, however, is one of labor. The shoe manufacturer realizes that to finish the edges and bottoms of fiberized soles means an extra operation or at least a different one and this means a change in the existing labor schedule. He does not take kindly to a plan or suggestion that will disturb a class of labor which has already shown itself to be highly sensitive to price schedule agitation and changes. Makers of shoe inks and finishes for these soles have much to do along constructive research work and toward the

production of an edge ink that may be set and worked in the customary way without chipping off the edge with slight handling.

Manufacturers admit that fiberized soles do not require the handling before application that leather soles do. They are also aware of the fact that a lesser number of operations is necessary to attach and finish them. Besides these two very substantial savings in handling and manipulation they are confronted by the fact that instead of paying an average price (today) of 90 cents per pair for oak leather soles, they can buy a fiberized sole that will wear as well, if not better, for 45 cents. In addition they may capitalize as they please on the additional benefits of flexibility and waterproofness. Many shoe manufacturers agree that where there is such a ready method of effecting economies in shoe cost without impairing the value to the wearer, a little greater effort in the matter of style and finish is worth while and they are concentrating their attention upon these points.

HINTS TO RUBBER SOLE MANUFACTURERS.

Rubber manufacturers must bear in mind the fact that no fiberized product can be a "blooming" stock and be permanently successful with the shoe trade. Its very appearance is against it and, moreover, all efforts at better finish will have been defeated for this bloom will destroy them.

Fiberized soles that stretch appreciably are equally undesirable, for it matters not whether they stretch in attaching or in wearing, the very mischief is the result. Style features and the lines of the last and pattern are built into a shoe and once built in, they must not be lost through instability in the sole itself. Soles have been produced that are wonderfully free from stretch in either direction so it is evident that this point has been realized.

The fibrous content of these compounds is an important matter for the various ingredients must be bonded together in a tough, fibrous mass that will lend itself to the process of "loose-nailing" these soles in shoe manufacture. Such soles should be available for heavy work shoes where only nailed work is desirable. Some soles have met with partial success in this direction, but for one reason or another the field remains hardly touched as yet. Consider for a moment the fact that such a shoe would have a bottom impervious to the action of lime and phosphate fertilizers used on farm lands, unaffected by the ammonious seepage of barn and farm-yard enclosures, and withal, be waterproof and slip-proof to all kinds of walking.

One of the truly important fields for these supersoles is in the manufacture of children's shoes. Let the little ones go to school staunchly clad with shoes bearing waterproof, slip-proof and durable soles instead of soft, spongy, water and dew-soaking leather soles. Very close cooperation between the manufacturers of children's shoes and fiberized soles should prevail and for mutual advantage.

Some mechanical difficulties seem to have thus far beset those who have tried to manufacture a fiberized product in sheet form. Such a soling would meet with a ready sale as has been proved by the few partially successful attempts in this direction and all that seems now to be necessary is persistent research and mechanical genius to bring about perfected processes for manufacture.

Soles of lighter gravity are also needed. At present the leading products compare favorably with sole leather, but as the thickness of fiberized soles is nearly always greater than leather soles for the same shoe, some product of lesser gravity should come forth to offset the actual difference in weight. Lightweight compounds have been produced with gravities as low as 1.03 which is considerably below the average product today of 1.30. A compromise gravity figure of 1.15 should be easily obtainable.

THE SUCCESS OF COMPOSITION SOLES.

Let it be known that various fiberized soles have already proved their value in wearing tests on the soles of Army shoes in actual warfare and in cantonment usage. Under Government tests these

materials have repeatedly outworn leather soles. In addition they have offered slip-proof and waterproof features besides great flexibility and ease in breaking in new shoes. Not only in the Army have these tests been made, but in civilian life as well, and many reports are available where fiberized soles have greatly outworn leather on the shoes of men, women, boys, and girls.

Men accustomed to being out in all inclemencies of the weather, declare that fiber soles protect their feet completely and give them greater walking comfort than does leather. A railroad fireman once told the writer he liked their "sure footed" feeling when he swung up the steps of his cab and that they outwore leather soles when in contact with hot coals and cinders.

Orthopedic surgeons state with perfect frankness that fiberized soles allow the muscles of the feet to flex and function with greater ease and regularity, and thus guard the feet from many of the ills caused by undeveloped foot muscles and retarded blood circulation in the extremities.

Those who have come to know fiberized soles for what they are have learned to swear by them instead of at them and only lament the fact that they are not obtainable on a greater variety of shoes. Any Boy Scout who has worn fiberized soles will assert that he likes them because he can climb the rocky and grassy places without fear of slipping and that his feet do not tire easily on the long "hikes" with his company.

ATTRACTIVE BUSINESS POSSIBILITIES.

Rubber manufacturers will appreciate the fact that fiberized soles are not a seasonable product like garden hose, but that they are a steady all the year around product for the manufacturer who can produce a compound that will meet the requirements. The whole rubber trade should work together for a product that will meet these demands—one that will attach to heavy shoes with nails, one that will apply to children's shoes without ripping and puffing and one that will apply to house slippers and thus afford comfort and surefootedness at every step. These problems once solved, a business comparable with almost any of the other great industries in rubber is assured.

SIXTH NATIONAL CHEMICAL EXPOSITION.

The Sixth National Exposition of Chemical Industries, which opens September 20, at Grand Central Palace, New York City, will be the biggest display of its kind ever seen. Four floors of the Palace are necessary to house the display, and because of the remarkably wide range of the exhibits this year, the exposition will be divided into sections.

The New Jersey Zinc Co.'s display will occupy booth No. 9 and a portion of booth No. 8, on the main floor, and be in charge of W. Homer Hendricks, general sales engineer. One exhibit will show the route of the zinc ore during manufacture, as well as the ultimate uses of the products. Various zinc products of the "Horse Head" family will also be displayed.

The Morse Chain Co., Ithaca, New York, will exhibit a number of samples of different chains, showing the Morse rocker joint, from 1/2-inch pitch to 3-inch pitch, and in several widths illustrating the chain as used for 1/2-h.p. to 5,000-h.p. T. G. Anderson, manager of the New York office, will be in charge, assisted by H. W. Evans, sales engineer.

The Uehling Instrument Co., 71 Broadway, New York City, will exhibit its fuel-saving device at the Chemical Show, and also at the National Association of Stationary Engineers Convention, Milwaukee, Wisconsin, September 13-17. The principal products to be displayed will be the new "Style U" CO₂ recording equipment, which measures the heat discharged up the chimney, and other boiler-room instruments.

The National Aniline & Chemical Co., New York City, will have a comprehensive exhibit of dyes and intermediates of their own manufacture, including rubber chemicals.

CLIFTON SLUSSER, GENERAL SUPERINTENDENT.

CLIFTON SLUSSER, who has been appointed general superintendent of the new Los Angeles factory of the Goodyear Tire & Rubber Co. of California, is one of the youngest men in the country holding an executive position of equal responsibility. He is but thirty years old and started with the Goodyear company less than nine years ago.



CLIFTON SLUSSER.

Born in Massillon, Ohio, Mr. Slusser left school when eleven years old to go to work as a glass blower. Since then he has been machinist's helper, plumber, and later drifted into the Goodyear employ as stenographer and utility man for William Stephens, now production superintendent of the Akron plant.

Meanwhile he had been adding what he could to his education at night in business colleges. At the Goodyear factory he at once arranged to take a factory course after hours, getting into overalls and working through every department. Whenever an emergency arose he got into it, and the harder the job the better he liked it. When the flood of 1913 tied up the Goodyear plant and volunteer workmen were called for, Mr. Slusser was the first to respond. His work in this emergency brought him to the attention of P. W. Litchfield, factory manager, who chose him to organize the Goodyear Flying Squadron shortly after.

The Flying Squadron is a group of men who have worked through every department of the factory and are used to balance production. It now numbers 1,400 men and has already developed several hundred executives for the company.

All this time Mr. Slusser was studying business economy, factory management and corporation organization at night. Other opportunities came to him. He ran a department while the foreman took a vacation. He took charge of the Canadian plant during the illness of the superintendent. He organized an engineering squadron among the machinists and other mechanical men. Successively he took over the efficiency department, the planning department, the factory expert work, the company's garage and trucking work, the labor department and the aeronautical work. About a year ago he was made personnel manager and admitted to the executive council, a group of five men who, under Mr. Litchfield, are responsible for the operation of the entire factory now employing 33,000 men in Akron alone.

Mr. Slusser's promotion to complete charge of production at the new plant in the West, which will start operations with 5,000 men and will produce 5,000 tires a day at the outset, is the logical climax of his record in Akron.

A NEW RUBBER MAT.

A new white or marbled light, pliable rubber mat, known as the "La-tite," and which is made of live, elastic stock, clings closely to bathroom floors, ships' decks, and similar surfaces by having been cured on a rounded mandrel, which gives an unnoticeable curl to the edges. It has fine corrugations, even soft to bare feet, and can be scrubbed indefinitely. Hotels are using them to save the cost of laundering bath rugs, and for sanitary reasons. They are also being used in front of hotel room doors and dressers to save wear on carpets, the mats being obtainable also in several dark, solid colors to match most carpets. (George W. Eno Rubber Co., 1026 South Los Angeles street, Los Angeles, California.)

INTERNATIONAL DISCUSSION OF CLINCHER AND STRAIGHT-SIDE TIRES.

A VERY INTERESTING DISCUSSION between the editor of "Omnia," the well-known French automobile journal, and the technical assistant to the president of the United States Tire Co., regarding the advantages or disadvantages of the straight-side tire as opposed to the clincher tire, brings out the following points:

THE FRENCH VIEWPOINT.

Americans have gone back to rims with detachable side rings, and even split rings which the countries that invented the automobile, with France in the lead, devised in the early days of pneumatic tires but soon found to be wrong in principle and discarded.

The fundamental fact in this pneumatic tire question is that the Americans have never been able to attain perfection in the manufacture of soft tire beads. They have never been able fully to obtain that combination of strength and flexibility from which the clincher bead tire derives its true value. They grew impatient and not wishing to experiment, pulled out of the dust of our stock-room the stiff bead, the bead with cables buried in it, and decided to use this type of bead in spite of everything.

Europeans mount their tires on one-piece rims by stretching their flexible beads over a groove into which the beads slip once they are in place. This is the clincher type.

Americans do away with the beads, make the sides of their tires straight and vertical, and insert into them non-stretchable steel cables, which makes it necessary first to split the rim and then to reinforce the parts.

If an American has a break-down, in nine cases out of ten he does not personally try to solve the trouble. He puts his car in a garage and leaves the work to a professional repairman.

This custom is easy to follow over there for the reason that automobile riding is largely restricted to cities, big suburbs, and highways, where repair shops are abundant. Such a great number of cars necessarily results in a huge number of repair specialists, it is easy to understand that these specialists can afford first-class shop equipment.

On the other hand, in France the number of automobiles in use is comparatively insignificant—90,000 in 1919. Motor cars are widely scattered and repairmen are few and far between. For these reasons the solution of tire troubles falls on the driver and the work has to be done on the road.

This difference of conditions is vital. It constitutes practically the whole problem.

THE AMERICAN ANSWER.

The straight-side tire was built because it was felt that a more dependable, safe and simple fastening than the hooked bead of the clincher type was needed for heavier cars. For safety and dependability we wanted a tire which could not under any conditions blow out over the rim—one in which the beads did not require a secondary locking device such as lugs, spreaders, etc., to hold them in place once the primary locking device—inflation pressure—suddenly vanished through a puncture or blowout. We also sought a combination of bead and rim contour that would not allow the gouging of the tire by the edge of the rim when sudden deflation occurred in service.

As our development of the straight-side tire progressed, we found that we had introduced not only a more safe, dependable and simple fastening, but also a tire which would deliver consistently greater mileage than the best clincher tire we, or any others, could build. In studying the reasons for this difference, we have come to the conclusion that they lie in the better structural arrangement of the plies of fabric or cord at and above the bead proper and in the larger volume of air carried by the straight-side type. These are the basic reasons and they explain the margin in favor of the straight-side when tires of both types go through a road test without injury. The margin becomes still greater if the tires are run flat even the minimum distance re-

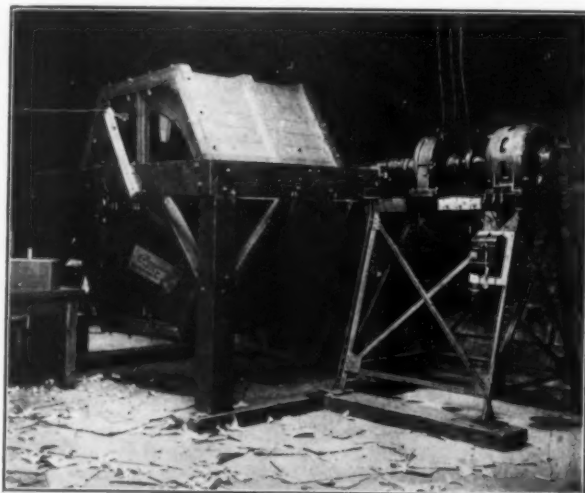
quired to stop the car after a puncture or cut has occurred. Under these conditions the deflated straight-side tire lies naturally over the out-turned flanges of the rim without injury, while the in-turned flanges of the clincher rim cut and chafe many miles out of the clincher tire. Furthermore, the straight-side tire will withstand under-inflation far better than will the clincher.

It is very easy to catch the tube under the toe of a clincher bead in mounting the tire—something which can not happen to the tube in a straight-side tire. Also, unless lugs are used, the tube in a clincher tire can easily be pinched under the beads when the toes of the latter rock as the car takes a curve at speed. In the straight-side type there is no rocking of the beads under any conditions.

TESTING SHIPPING BOXES.

IN A TEST for strength of shipping boxes, the object of which is a simulation of the rough knocks, bumps and jars of handling which a loaded box may encounter in railroad traffic, there has been designed a machine by which the railroad usage which a box may meet in a 2,000-mile haul can be duplicated in four or five minutes.

The first machine of this kind—known as the drum box-testing machine—was designed by the United States Government Forest Products Laboratory at Madison, Wisconsin. The results of the box tests made at this laboratory were published in THE INDIA RUBBER WORLD, August 1, 1919, pages 626-628.



DRUM BOX-TESTING MACHINE.

The machine installed at the Mellon Institute, shown herewith, is an improvement over the original tester in that the inconvenience of overhead pulleys and shafting has been done away with by the substitution of a reduction gear for cutting down the motor speed to the drum speed of two revolutions per minute.

A valuable field of investigation and scientific study of the construction and materials of packages is opened up by the new machine, such as best methods of interior and exterior packing for fragile or irregular shaped objects; the determination of proper specifications for containers carrying various commodities, etc.

The Container Club of Chicago, an association composed of corrugated and solid fiber box manufacturers of the United States, offers free service in the designing of scientific packing methods for the various commodities capable of being shipped in fiber containers.

Rubber Hose in Painting, Asphalt and Cement Coating.

THROUGH the development of paint guns, sprayers, and atomizers, for applying paints and protective coatings by the use of compressed air, rubber hose is now used very extensively. Painting with mechanical appliances for concrete and masonry surfaces, structural ironwork, bridges, ships, mesh-wire factory fences, tanks, castings, machinery, car trucks, underbodies and other large equipment has been a recognized method for several years, and has generally superseded the hand painter.

With the modern paint gun the work is done when wanted in a remarkably short time, with little or no interruption of business, without depending on a large labor force and at the lowest possible cost consistent with a thorough, durable job. The early difficulties, such as loss of paint, excessive scattering and spattering over surfaces not to be painted, lack of control in the wind, and volatilization of the paint oils while passing through the air have been overcome by the perfection of ingenious patent nozzles and the provision of special full body oil paints peculiarly adapted to the purpose.

With an ample length of rubber hose and a twelve-foot extension arm, scaffolding and swing-staging can be dispensed with very largely. Out of doors one man and a helper can cover from 1,000 to 2,000 square feet per hour, multiplying the labor value from eight to ten times. As compared with the hand method a saving of approximately \$1.50 per gallon can be effected. Indoor painting jobs can be done at the rate of 1,000 to 1,600 square feet per hour. The right paint applied to factory interiors by this method will conserve much light, thereby saving electric current, eyesight and daylight working hours. It gives a smooth, fine, hard, dirt-resisting coating having neither the chalky whiteness that absorbs light and quickly becomes dirty, nor the glossy surface that causes a blinding glare or dazzling flicker. It diffuses light as it reflects it and fills the interior with a soft, even radiance. Moreover, a film of paint can be built up in one operation that is the equivalent of two or three hand brush coats.

The method is equally efficient on any surface, from smooth

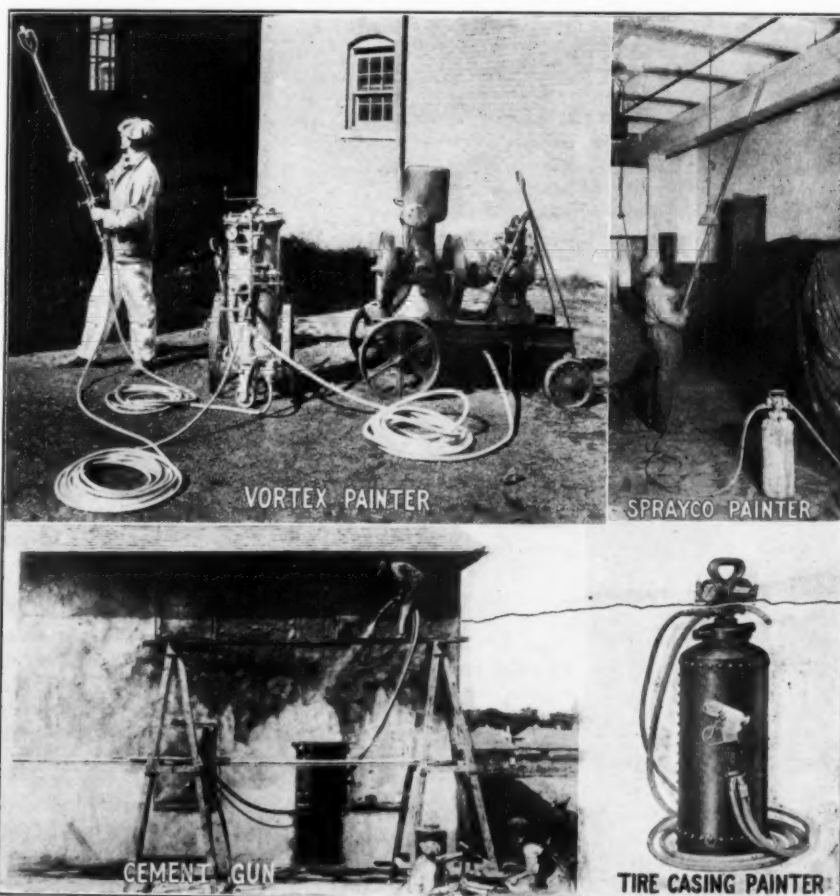
wood finish to the roughest masonry, and can be used to special advantage on cast stucco, rock-faced walls, rough lumber, brickwork with recesses, broken-down masonry joints, surfaces under eaves, lattice work, structural steel, and all places inaccessible to a brush. This is because the perpendicular application of the paint is certain to penetrate voids better than brushing across the surface.

An efficient brushing action by the powerful compressed air jet is of advantage for cleaning dirty surfaces and in reaching corners and crevices for which the hand painter's implements, the wire brush, putty knife and cloth, are inadequate.

A pneumatic painting outfit consists essentially of a paint tank with the necessary valves, gages, etc., a motor-driven air-compressor, a nozzle or brush and the rubber connecting hose for paint and air. The paint, ready for application, is poured into the tank. An agitator, operated by hand or compressed air, is available for use when necessary. A compressed air line leads to the tank with a branch line for air and paint from the tank to the nozzle. Sometimes the former is ordinary $\frac{3}{8}$ -inch heavy air hose, while the latter is $\frac{1}{4}$ -inch flexible metal-lined oil suction hose, having

coiled coppered-steel wire embedded in the wall to give it strength and rigidity. The lining, friction and cover of this hose are specially compounded to resist the action of the oil and paint, as it is important that the rubber shall not flake or peel off and get into the delicate orifices of the spraying nozzle. The adhesion of the rubber friction must be especially strong in order to retain the wire firmly in place. Special paint hose, three, four and five-ply, is also made with internal diameters of $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 and $1\frac{1}{4}$ inches, having a ply of seamless braided material over the plies of duck, with a rubber cover over this, so that the structure of the hose is held intact, preventing the duck from unwrapping and coming apart after long contact with oil and paint.

Many of the leading rubber companies are employing these pneumatic painters for their buildings, factory interiors, etc., and several of them use a special equipment with a compact nozzle



SPECIAL RUBBER HOSE IS NECESSARY EQUIPMENT FOR PNEUMATIC SPRAYING MACHINES.

resembling a pistol and trigger operated to paint the inside of pneumatic tire casings with soapstone paint. For whitewashing and applying cold water paint to factory interiors, where power is not available, a double-acting cog-gear spraying machine that operates by hand can be utilized to excellent advantage.

ASPHALT AND ROCK GRIT SPRAYING.

The pneumatic spraying principle has also been applied in building. By means of a special gun, side walls and ceilings are plastered, foundations and floors are damp-proofed and concrete structures are waterproofed, with a coat of pure asphalt compound, applied at normal temperature and under high pressure. This hermetically seals the surface and protects the plaster against water damage, stain, cold air infiltration and the lime sulphite salts in concrete which cause plaster to decrystallize. Over this a coat of rock grit, also gun applied, makes a scratch coat that requires only a finish coat of plaster in order to give a ceiling of excellent whiteness for light conservation or ideal for decorating. Side walls prepared in this manner and given two,

instead of the usual three coats of gypsum hard plaster, afford complete insulation, overcoming all sweating and condensation of moisture. For applying the scratch coat, sand-blast hose is used, having a heavy lining of rubber to resist the cutting action of the rock grit.

With the asphalt gun concrete structures, such as basements, reservoirs, bridge decks, etc., are water-proofed



HAND-POWER SPRAYER.

with asphalt compound and built out to sufficient thickness with mastic or membrane. Dampproofers are also applied to foundation walls that are to be furled and to cinder-fill mixtures under matched flooring. The gun cleans the voids, fills them full of asphalt and builds out in an even, laminated coating. Speed renders this method advantageous for quick construction.

SPRAYING PORTLAND CEMENT.

Reversing the arts of war, the destructive principles of gun-fire are being employed in the constructive arts of peace, and a cement gun, much like the paint and asphalt guns, is being used for rapid-fire building in England. At Southend-on-Sea a house-building company is putting up houses having wooden frames covered with tar felt and wire meshing. A cement gun is used to spray prepared cement from a large hopper to cover the meshing. In this way 15,000 square feet can be laid in eight hours.

These modern methods in building and structural maintenance depend in large measure upon flexible rubber hose for their efficiency. And confronted as the whole world is by such a serious shortage of houses, it seems likely that these devices which save time and labor, speed up production, and save expense, will quickly come into general use.

REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS—H. C. Pearson's "Crude Rubber and Compounding Ingredients."

JUDICIAL DECISIONS.

GAMMETER VS. BACKDAHL.—Court of Appeals, District of Columbia. Decided June 2, 1920.

Appeal from a decision of an assistant commissioner of patents in an interference proceeding awarding priority to Backdahl for an invention filed December 14, 1915, relating to a metallic mandrel for curing tires. Gammeter conceived and disclosed his invention September 7, 1915, endeavoring meanwhile to evolve a fluid-tight, expandable lead core adapted to produce a cord as well as a fabric tire.

The Examiner of Interferences and the Board of Examiners-in-Chief held that Gammeter was diligent at the time Backdahl entered the field and reasonably diligent from that time until the filing of his application. The Assistant Commissioner disagreed with this finding and therefore reversed the decisions of the lower tribunals.

Where, as here, it clearly appears that the party first to conceive the invention was in good faith engaged in perfecting it at the time his adversary entered the field, that party should not be deprived of the fruits of his discovery because his efforts were not as successful as he hoped they would be.

Therefore, the Examiner of Interferences and the Board of Examiners-in-Chief, being convinced that Gammeter was not lacking in diligence, reversed the decision of the Assistant Commissioner and awarded priority to Gammeter. ("United States Patent Office Gazette," July 27, 1920.)

THE WOOLDRIDGE & FOX BALLOON FABRIC PROOFING PATENT.

In 1916, patent No. 105,137 was granted to Wooldridge & Fox, for "Improvements in impregnating compositions for proofing fabrics and other flexible materials." In 1917 the North British Rubber Co., Limited, applied for revocation of that patent, or a specific reference to its own patent, No. 5,915 of 1915, for "An improved fabric for balloon envelopes and the like, and the method of manufacturing and aftertreating the same," on the ground that the invention claimed in the patent of 1916 had been claimed in the patent of 1915.

The application was dismissed by the Chief Examiner, who ordered, however, that the specification be amended by the insertion of a general reference to the state of the art. An appeal to the Court by the North British Rubber Co., Limited, was later dismissed, it being held that the invention of the patentees was not the same as that of the opponents; that, even if a fabric made in accordance with the claims to which objection was taken would be an infringement of the opponent's patent, that would not in itself, be a sufficient reason for striking out those claims; that the object of the insertion of a specific reference was not to preserve or assist the opponent's rights, but to protect the public in cases in which, but for the insertion, they would be likely to be misled; and that there was not sufficient reason for giving any special warning. (Supplement to "The Illustrated Official Journal" [British patents], June 30, 1920.)

"BOX WORN" MEANS ABOUT THE SAME THING IN THE AUTO INNER tubes as "shop worn" means in clothes. Both are damaged goods. When an inner tube leaves a rubber factory, it is ordinarily packed in waxed paper and placed in a box to keep it in perfect condition. But this waxed paper packing will not protect the tube carelessly thrown in the tool box of a car, where the constant jolting and swerving of the car cause the loosely packed tube to chafe through at the folds.

Tubes will remain in the same serviceable condition as when placed in the car, if carefully wrapped in soft cloth or paper so that they cannot slide around in the wrapping. Better even than this, however, is the purchase of a tube bag. It is not only excellent but cheap insurance against tube cutting and chafing. (The Miller Rubber Co.)

THE DOLLAR IS BIGGEST IN BUYING TIRES.¹

CAREFUL ANALYSIS of the rubber tire manufacturing business does not indicate a downward trend of tire prices, according to expert business analysts, whose opinion is based upon the comparative increases in price of practically all commodities

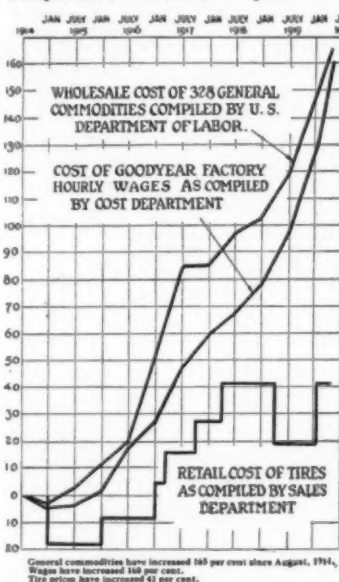


CHART SHOWING WHY PRESENT TIRE PRICES ARE LOW.

hold furnishings, with commensurate percentages of increase in the prices of practically all other commodities.

The sudden curve back from the peak of high prices, precipitated by currency deflation and restriction of credit, unquestionably has led many motorists to anticipate a drop in tire prices, and consequently has caused many to delay contemplated purchases until the drop could come. But the comparatively low price of tires at this time does not indicate such a downward trend. Hence it is argued that while the American public may be justified in waiting for prices of certain commodities, which now are selling at better than 100 per cent advance over 1914, to decline, there is nothing to justify a similar decrease in prices of tires.

Another important factor is the added mileage and greater durability of the highly perfected tire today. Six years ago a four-thousand mile tire was unusual. Today, an 8,000-mile tire performance is a very ordinary record. Figuring conservatively upon this mileage basis alone, a 1920 tire will deliver at least 100 per cent more mileage than a 1914 tire, and yet costs but 37 per cent more. The tire selling for \$50 in 1914 cost one and one-quarter cents per mile, based on 4,000 miles of service. The same tire now gives at least twice the mileage and costs only \$70, making the cost per mile only seven-eighths of a cent. This means that the same mileage actually is being purchased today for 30 per cent less money.

This improvement in the 1920 tire over the 1914 tire, it is pointed out, even is more marked in a comparison of the 1910 tire with that of today, the average mileage today being fully three times that of a 1910 tire. Motorists in 1910 paid \$35.65 for a 30 by 3½ tire, and \$11.90 for the same size of tube. Today they pay only \$23.50 for the same tire and \$4.50 for the tube—getting three times the mileage for \$19.55 less money. On the 34 by 4 tire, the 1910 price was \$53.40 compared to \$40.10 today, and \$14.90 for a tube as compared to \$36.30 today—a saving to the

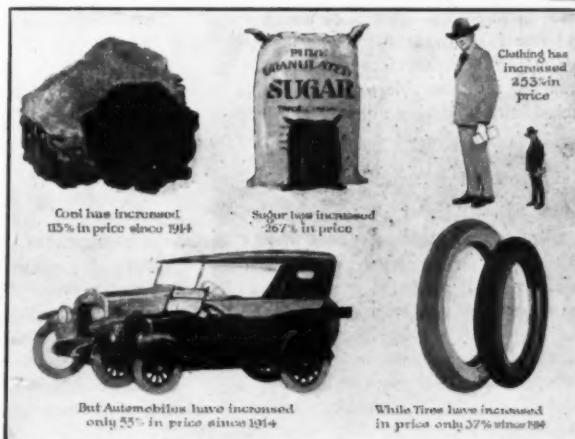
within the past six years, and the fact that automobile tires are today nearer their pre-war level of prices than nearly every other staple article upon the American market. The basic factor in drawing the conclusion that tire prices will remain staple while prices of many other articles may be expected to drop with further deflation of currency, is the fact that the consumer now is paying only forty-one per cent more for tires than in 1914, whereas he is paying 253 per cent more for wearing apparel than in 1914, over 113 per cent more for fuel and light, 267 per cent more for sugar, and 231 per cent more for house-

motorist of \$21.90 per tire, or \$87.60 for full tire equipment, with three times the 1910 mileage.

There are several elements directly responsible for this condition. Principal among them is the improved method of manufacturing automobile tires, of raising and curing rubber and of making cotton tire fabric, all made possible through long experience, careful research work and the invention of more modern machinery. Secondly, quantity production has permitted greater manufacturing economy, overhead reduction and the marketing of the finished tire at a lower cost to the consumer. Were conditions normal and were the purchasing value of the dollar not cut practically in two, prevalent tire prices might not be considered so unusual. But when it is taken into consideration that wages, freight rates, food prices, the cost of cotton and the various compounding ingredients used in the manufacture of tires have soared, and in nearly all cases more than doubled, the fact that automobile tires are of better quality and yet are selling for less than they did ten years ago constitutes a refreshing thought and a decided relief from the incessant reminder of the high cost of living.

Since August, 1914, the price of cotton has jumped from 20 cents a pound to \$1.35 a pound—an increase of 575 per cent. The manufacturing cost of cotton fabric for automobile tires has increased 190 per cent, while the cost of compounding ingredients has increased approximately 68 per cent. The price of crude rubber today is unusually low, compared to other materials; but the present low level in price does not affect tire prices, due to the fact that vast quantities of rubber were contracted for before the break in price.

The present "hold back" attitude of the motoring public is believed due to a misunderstanding of actual facts, and to a lack



HOW THE PURCHASING VALUE OF OUR DOLLAR HAS SHRUNK! THESE SHADED AND DARK AREAS SHOW THE PERCENTAGE OF DECREASE IN A DOLLAR'S PURCHASING POWER, WITH REFERENCE TO VARIOUS COMMODITIES, AS COMPILED BY THE UNITED STATES DEPARTMENT OF LABOR.

of appreciation of the availability of automobile tires at prices so near their pre-war level. In business circles it is felt confidently that prices of practically all other commodities will have to break and show an appreciable decline, before the situation will justify any reduction in tire prices.

A NEW FORM OF COMPOSITE BELTING IS THE INVENTION OF ROBERT Russell of Middleton, England. It affords a new use for waste leather, and is said to combine all the advantages of balata and rubber belting, without the disadvantages of either. It does not absorb oil and moisture, as a leather belt does; nor is the outside portion wrenched and stretched, as is so often the case with rubber belting.

¹ By Ralph C. Busbey, Goodyear News Service.

S. A. E. Standards Report of the Tire and Rim Division.

THE FOLLOWING REPORT of the Tire and Rim Division of the Society of Automotive Engineers, as amended and accepted by the Standards Committee, was approved by the Council at the general meeting of the Society, held at Ottawa Beach, Michigan, June 21. These new standards require only the approval of the members of the Society to be obtained by letter ballot.

AUTOMOBILE RIM VALVE HOLES.

The Tire and Rim Division recommends that the present S. A. E. standard for automobile rim valve holes be extended to include the dimensions for the 5, 8 and 10-inch tire rims and that certain lengths in the present standard be increased. The present S. A. E. standard revised and extended as recommended by the Division is given in the accompanying table:



Rim size	inches	3½	4	4½	5	6	7	8	10
A (min.)		5/16	9/16	5/8	11/16	2 1/8	2 3/8	3 1/4	4 1/4

FELLOE-BAND TOLERANCES.

Owing to variations in the thickness of commercial tapes, with the resulting inaccuracy of wheel measurements, it is recommended that approved standard tapes be used for measuring felloe-band circumferences, of which one set is intended for truck and one for passenger-car wheels.

The Division therefore recommends that the present S. A. E. standard for allowable tolerances in felloe-bands be extended to include the following note:

It is recommended that all measurements of truck and passenger-car wheel circumferences be made with approved standard wheel tapes furnished by the Tire and Rim Association.

DEFLECTION AND SET TEST OF AUTOMOBILE PNEUMATIC TIRE RIMS.

The present S. A. E. standard for deflection and set test of automobile pneumatic tire rims specified the pressure, deflection and permanent set for 3½, 4, 4½, 6 and 7-inch rims only. The Tire and Rim Division now recommends the pressure, deflection and permanent set for the 5, 8 and 10-inch rims. The present S. A. E. standard extended to include the Division's recommendation follows:

PNEUMATIC TIRE RIM TESTS.

Rim Size Nominal, Inches.	Maximum Pressure, Pounds Per Square Inch.	Maximum Deflection, Inches.	Total Permanent Set, Inches.
3½	140	0.06	0.02
4	160	0.07	0.03
4½	180	0.10	0.06
5	190	0.12	0.06
6	200	0.15	0.06
7	225	0.15	0.06
8	250	0.15	0.06
10	250	0.15	0.06

The deflection should be measured from a fixed inflation load of 25 pounds per square inch for 3½, 4 and 4½-inch sections, and 50 pounds per square inch for 5-inch and larger sections up to the maximum pressures given.

MOTORCYCLE RIM SECTIONS.

Circularization of the motorcycle industry last year indicated that standard current practice includes only tire sizes which are

mounted on the CC rim. These tire sizes were adopted by the Society last winter and in order that the rim specification shall be in conformity with this list of tire sizes the Tire and Rim Division recommends that the BB rim section be withdrawn from the present S. A. E. recommended practice for motorcycle rim sections. It is the opinion of both the Motorcycle and Tire and Rim Divisions that the BB rim section can be reestablished as a standard should the use in the future of light weight motorcycles carrying the BB rim become general enough to warrant its inclusion in the standard.

CARRYING CAPACITY OF SOLID TIRES.

Solid Tire Width, Inches.	36-Inch Diameter or Less.	40-Inch Diameter.
3	1,000	.....
3½	1,300	.....
4	1,700	.....
5	2,500	3,000
6	3,500	4,000
7	4,500	5,000
8	5,500	6,000
10	7,500	8,000
12 .....	.....	10,000
14 .....	.....	12,000

The present S. A. E. standard for carrying capacity of solid tires has been criticized to the effect that at rated truck capacity an increase in the tire carrying capacities would be justified in practically all sizes and would conform to general practice.

The Division therefore recommends that the carrying capacities specified in the present S. A. E. standard for carrying capacities of solid tires be revised to conform to capacities given in the above table.

PNEUMATIC TIRES FOR PASSENGER CARS AND COMMERCIAL VEHICLES.

The Division recommends that the present S. A. E. standard for pneumatic tires and rims for passenger cars and commercial vehicles be revised so as to eliminate the 42 by 9-inch tire and rim as regular equipment. This size tire is considered a special application as the oversize for the 40 by 8-inch on pneumatic-tired trucks and not as a regular size. It is also felt by the Division that the 44 by 10-inch is now well enough established to be included in the standard as regular equipment.

The S. A. E. standard revised as proposed is as follows:

Nominal Tire and Rim Sizes.		Oversize Tire.		Tire-Seat Diameter (Rim).		Type of Rim.
In.	Mm.	In.	Mm.	In.	Mm.	
30x3½	90/585	31x4	105/585	23	585	Clincher
32x3½	90/635	33x4	105/635	25	635	Straight side
32x4	105/610	33x4½	120/610	24	610	Straight side
33x4	105/635	34x4½	120/635	25	635	Straight side
33x4½	120/610	34x5	135/610	24	610	Straight side
32x4½	120/585	33x5	135/585	23	585	Straight side
34x4½	120/635	35x5	135/635	25	635	Straight side
34x5	135/610	36x6	150/610	24	610	Straight side
36x6	150/610	38x7	175/610	24	610	Straight side
38x7	175/610	40x8	200/610	24	610	Straight side
40x8	200/610	42x9	225/610	24	610	Straight side
44x10	250/610	.....	.....	24	610	Straight side

RIM SECTIONS AND CONTOURS FOR PNEUMATIC TIRES.

The Tire and Rim Division recommends that the present S. A. E. standard for rim sections and contours for pneumatic tires for passenger cars and commercial vehicles be revised in accordance with the dimensions submitted in the following table. This table has been extended to include the dimensions for the 5-inch rim recently adopted and for the 10-inch rim which is recommended for adoption. The radius of the fillet for the 3½, 4 and 4½ straight-side rims has been increased from 3/32 to 3/16-inch owing to trouble which has been experienced with rims cracking at this point. Tolerances have also been placed upon the height of the 3½-inch rim.

These revisions have been adopted by the Tire and Rim Association and are in accordance with present practice.

There was considerable discussion in the Standards Committee meeting relative to establishing in the standard a single set of rim and felloe-band dimensions to provide for interchangeability of the 36 by 6, 38 by 7 and 40 by 8-inch pneumatic tire on a single rim, and also the interchangeability of this application on the wheel. This matter is to receive early consideration by the Tire and Rim Division and representatives of other automotive industries who are interested in this matter.

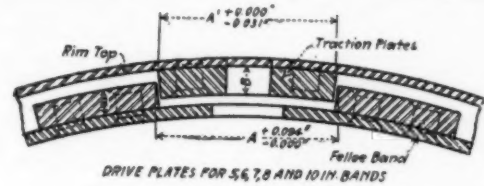
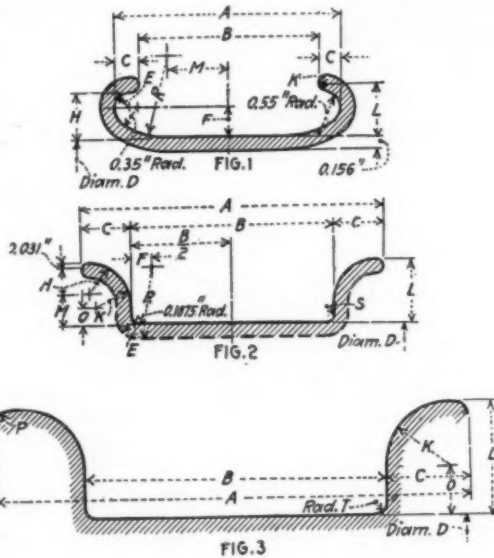


FIG. 4. TRACTION PLATE DIMENSION.

Rim Size.	A.	B.	Width of Traction Plates.
5	2 1/2	3/8	1 1/2
6	2 1/2	3/8	2
7	2 1/2	3/8	2 1/2
8	2 1/2	3/8	2 3/4
10	3	3/8	3 1/4

NOTE. Information recently received indicates that this report as approved by the Standards Committee should be modified as follows:

Dimensions A' on the drawing are the same as A in the table and the tolerance on A' should be plus 0.000-inch, minus 0.031-inch. The width of traction plate for the 10-inch rim should be 3 1/8-inch. In marking letter ballots members should indicate whether they approve the report with these corrections included.

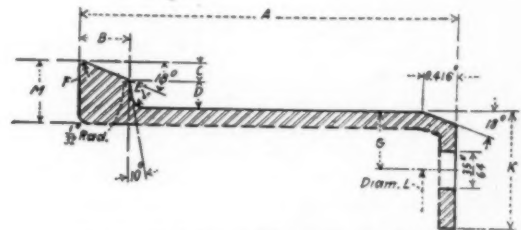


FIG. 1. 5, 6, 7 AND 8-INCH FELLOE-BAND.

PNEUMATIC TIRE-RIM SECTIONS AND CONTOURS.

Fig. No.	Nominal Tire and Rim Size.	Rim Diam. (Tire Seat).	Rim Circum. (Tire Seat).	A.	B.	C.	R.	E.	F.	H.	K.	L.	M.	O.	P.	S.	T.
1	30x3 1/2	23	72.257	2.600	2.050	±0.046	0.275*	0.910	0.1400	0.3400	0.50	0.0780	0.5780	±0.008	0.680	1.000	0.0625
2	32x3 1/2	25	78.540	3.432	2.312	±0.046	0.560	0.840	0.1875	0.2500	0.32	0.5100	0.6870	±0.0125	0.367	0.1990	0.0625
3	32x4	24	75.398	3.888	2.688	±0.046	0.600	0.840	0.1875	0.2500	0.34	0.5600	0.7800	±0.0075	0.440	0.2450	0.0625
4	34x4	26	81.681														
5	32x4 1/2	23	72.257	4.380	3.120	±0.046	0.630	0.840	0.1875	0.3125	0.38	0.6150	0.8750	±0.0075	0.495	0.3030	0.0625
6	33x4 1/2	24	75.398														
7	34x4 1/2	25	78.540														
8	34x5	24	75.398	5.310	3.750	±0.047	0.780					0.6250	1.0625	±0.024	0.4375	0.0940	0.2500
9	36x6	24	75.398	6.330	4.330	±0.047	1.000					0.7187	1.2656	±0.024	0.5469	0.1400	0.2500
10	38x7	24	75.398	7.000	5.000	±0.047	1.000					0.7187	1.2656	±0.024	0.5469	0.1400	0.2500
11	40x8	24	75.398	8.500	6.000	±0.063	1.250					0.8750	1.5000	±0.031	0.6250	0.1500	0.3125
12	44x10	24	75.398	10.330	7.330	±0.063	1.500					1.2500	2.0000	±0.031	0.7500	0.1875	0.3125

All dimensions are in inches. *Tolerance of +0.016, -0.008 in. apply to this dimension.

PNEUMATIC TIRE FELLOE BAND.

An agreement has been reached among rim manufacturers for the dimensions of the 5, 6, 7, 8 and 10-inch pneumatic truck tire felloe bands, which are given in the accompanying tables. This proposal has been accepted by the Tire and Rim Association and the Tire and Rim Division recommends it for adoption as S. A. E. standard.

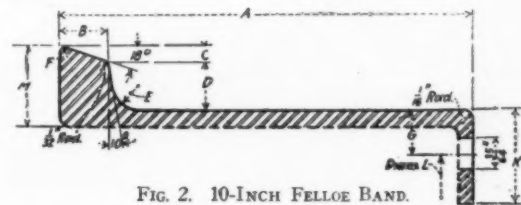


FIG. 2. 10-INCH FELLOE BAND.

PNEUMATIC TIRE FELLOE-BAND DIMENSIONS.

Fig. No.	Rim Size.	A.	B.	C.	D.	E.	F.	G.	K.	M.	L. Bolt Circle Diameter.	Bolts (Fig. 3).	
												Number.	Length.
1	5	2 1/2	3/8	0.153	3/4	3/8	3/8	0.656	1 1/2	0.558	21.375	8	3 1/2
1	6	2 1/2	3/8	0.183	17/64	3/8	3/8	0.750	1 1/2	0.636	21.125	10	4 1/2
1	7	2 1/2	3/8	0.183	17/64	3/8	3/8	0.750	1 1/2	0.636	21.125	10	5 1/2
1	8	2 1/2	3/8	0.183	23/64	3/8	3/8	0.625	1 1/2	0.729	21.125	10	5 1/2
2	10	3	3/8	0.203	0.620	3/8	3/8	0.563	1 1/2	1.042	20.625	10	6 1/2

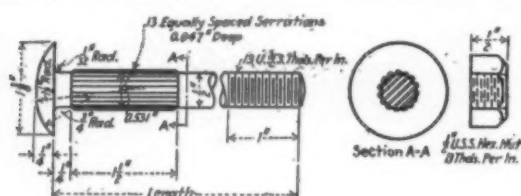


FIG. 3. BOLT AND NUT.

NOTE.—Information recently received indicates that this report as approved by the Standards Committee should be modified as follows:

Dimensions G in the table apply to felloe-bands for metal wheels. The corresponding band dimensions for the 6, 7 and 8-inch rims for wood wheels should be 0.688-inch. The felloe-band bolt circle diameter L for the 6 and 7-inch rims on wood wheels should be $21\frac{1}{4}$ and 21-inch for the 8-inch size.

In marking letter ballots members should indicate if they approve the report with these corrections included.

CARRYING CAPACITIES AND INFLATION PRESSURES FOR MOTORCYCLE TIRES.

The revised S. A. E. Standard for motorcycle tire sizes includes 3 and $3\frac{1}{2}$ -inch sections only, and it is therefore recommended by the Division that the carrying capacity and inflation pressure for the $2\frac{3}{4}$ -inch motorcycle tire be omitted.

A Fund for Botanical Research in the Tropics.

THE CONTINUED SUCCESS of tropical agriculture, notably plantation rubber, tea, coffee, coconuts, fibers and timber, is dependent very largely on maintaining an adequate force of properly trained scientific men to supervise the work. A veritable army of specialists is required to attend to the many diseases now attacking cultivated plants, to the biochemical problems associated with the manufacture of tropical produce, to questions of plant breeding and selection, and also the bacteriology of soils.

It is from the Imperial College of Science and Technology in London, England, that most of the trained men in this field have come in the past and must come in the future. Tropical agriculture has been to a great extent a British industry, and the Botanical Section of the Department of Biology of the Imperial College has in consequence become the recognized fountain head of information pertaining to it.

The Botanical Section is staffed by ten eminent professors, lecturers and demonstrators and many graduate students are doing excellent work in rubber growing and tropical agriculture generally. Among the latter may be mentioned H. G. Freeman, director of the Royal Botanic Gardens at Trinidad, and assistant director of agriculture for the West Indies; R. M. Richards, mycologist to the Planters' Association of Malay; F. J. F. Shaw, D. Sc., mycologist to the Indian Agricultural Service at Pusa; E. Bateson, assistant mycologist to the Agricultural Department of the Federated Malay States, now in Borneo; W. Noel, assistant superintendent in agriculture, Barbados, now mycologist to the Imperial Department of Agriculture in the West Indies; C. O. Farquharson, Government mycologist in Nigeria, recently deceased; A. Sharples, chief mycologist, Federated Malay States; H. C. Pinching and H. Sutcliffe, mycologists to the Rubber Growers' Association, Malay; H. W. Jack, assistant inspector in agriculture, Federated Malay States; A. T. Reeve, plant physiologist and mycologist to the Rubber Growers' Association, Ceylon; T. Thornton, cotton and fiber expert, Nigeria; T. Laycock, Agricultural Department, Kamerun and Nigeria; F. D. Stock, botanist to Burma, India Office; W. L. Hall and H. R. Jones, entomologist and mycologist, respectively, to the Egyptian Government; Sydney Morgan and G. S. Whitby, chemical researches on rubber for the Rubber Growers' Association.

An exhibition was recently held by the Imperial College to illustrate the diseases affecting rubber trees and the laboratory methods now adopted to determine the life histories of specific fungi harmful to cultivated plants. Many prominent rubber growers in attendance expressed a wish that the exhibit might remain available for permanent study, so that their codirectors, managers and assistants might, from time to time, interest themselves in the mycological research carried on by the Botany Section. Unfortunately this is at present impossible, owing to the limited space in the present buildings of the Imperial College

and the overcrowded condition of its various departments. Moreover, for the same reason, the rector of the college has very reluctantly had to refuse admittance to a large number of students desiring to specialize in research of value to the plantation world.

Even in pre-war days the Department of Biology found it almost impossible to satisfy the demand for men to engage in research relating to plant diseases. There is ample evidence that the future demand will be out of all proportion to the supply, both private firms and the Government having evidently decided to maintain and increase the number of scientific officers to act as advisers on problems of plant sanitation, breeding and soil conditions.

The Department must, even if it is to meet the demands made in the interests of tropical plantations alone, be supplied with additional laboratories and money for the extension of its work, to say nothing of an endowment fund. A site has been selected and plans prepared for extensions near the existing botany building, to cost, for erection alone, £70,000. The Imperial College has received assistance on a large scale from the Government, and from the London County Council towards its annual maintenance, but is now compelled to seek private aid, and a public appeal has been issued by Lord Crewe, chairman of the governing body, Alfred Keogh, rector of the College, and J. B. Farmer, professor of botany and director of the biological laboratories.

Realizing the importance of the work to private enterprise in tropical agriculture, appreciating its debt to the Imperial College for bringing expert rubber staffs to their present state of efficiency, and knowing that helping this cause helps the plantation rubber industry, the Council of the Rubber Growers' Association has unanimously resolved to give its support to the appeal. A subscription of £1,050 has been pledged by the Association and an appeal signed by Norman W. Grieve and Stanley Bois, chairman and vice-chairman, has been issued to members and other interested parties. A permanent advisory committee of the Association will confer with the staff of the Botany Section of the College from time to time on matters of importance to tropical plantations.

Up to June 25, 1920, subscriptions totaled £15,700, as follows: Rubber Growers' Association, £1,050; Harrison & Crossfield, Limited, £1,000; Herbert Wright, £1,000; company groups, £10,364; individual companies, £1,992; non-producers, £294. Checks for this fund should be made payable to the Rubber Growers' Association and crossed "Botanical Research Account."

THE MILLER RUBBER CO., AKRON, OHIO, IS INCREASING THE space devoted to its tire-repair school, so that it will be able to double the number of pupils accommodated. Four hundred have already been graduated and there are now forty-five enrolled. Sometimes classes are even larger than this number.

TORON AND TORON-TREATED TIRES.¹

A NEW ARTICLE, "TORON," has recently been developed as a means of decreasing the cost, improving the quality and prolonging the life of both pneumatic and solid automobile tires. In the manufacture of tires, it is employed as a liquid to impregnate the fabric, cord and other fibrous material used in their

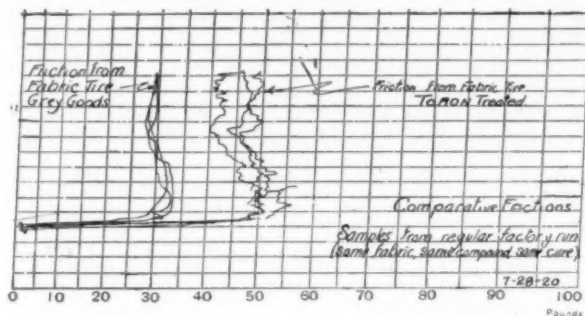


FIG. 1—GRAPHIC CHART SHOWING COMPARATIVE FRICTION TESTS.

construction. Chemically described, it is a sulphur terpene compound produced from reaction between turpentine and sulphur dissolved in a solvent such as xylol.

A marked characteristic of toron is its capacity to thoroughly penetrate fibrous material so that the fabric or cord is completely impregnated after the solvent is evaporated. This material possesses the additional characteristic of acting as a dye, thus coloring gray goods a pleasant yellow or khaki color. Moreover, the impregnated material gains in strength so that after treatment in association with rubber in a tire structure, American peeler acquires a strength comparable to Egyptian or Sea Island fiber as used in the manufacture of tires under the prevailing practice.

FRICTION INCREASED BY USE OF TORON.

More important still is the fact that rubber may be calendered to toron-treated fabric with ease and with a complete absence of skips or blisters, as the surface of the fabric is uniformly prone to adhesion with the rubber. As a consequence of this, spreading

of a piece of the same gray goods treated with toron, the friction of the first was 15 pounds while the friction of the second was 24 pounds. Hence a 60 per cent increase in friction was realized from the use of toron-treated fabric in the building up of the tire. Fig. 1 shows this increase in friction.

IMPROVED RESISTANCE TO DESTRUCTION BY FLEXING.

As is well known under the stress and strain, to which a revolving tire is subjected, owing to the roughness of the road, the tire is being continually contracted and expanded by an irregularly acting torsional force which causes "flexing." It is probable that flexing is the severest of the many adverse influences to which a tire is subjected in actual use, and this flexing tends to cause separation of the fabric, leading to bulging and blowouts.

In a toron-treated tire the surface of the fabric ply is not only uniformly attached to the rubber, but during vulcanization the rubber flows between and around the threads of the fabric, penetrating them and bonding them to the next ply, as shown in Figs. 2, 3, 4 and 5. As a consequence the load of flexing is carried by the rubber to a larger extent than in the older tire construction, since it is more difficult to separate rubber from rubber than rubber from gray goods.

In flexing, the play of fiber on fiber of the fabric causes these fibers to wear out. Resistance to this has been found to be greater in the case of fabric made of Sea Island or of Egyptian cotton than of American cotton, but it has now been shown that when fabrics made from American peelers have been toron-treated and built into tires they show a resistance to flexing equal if not superior to that of tires built with Sea Island or Egyptian cotton. From tests carried out on commercial vehicles it is assured that fabric tires may be constructed and sold carrying a guaranty of a minimum mileage of ten thousand miles, which is a condition never before approached in this manufacture.

PROTECTING THE FABRIC FROM OXIDATION AND ROT.

Of nearly equal importance to the life of a tire is the prevention of its more readily perishable parts from coming in contact with destructive agents. Cotton is very prone to oxidation and rotting, especially when exposed to air and moisture, and particularly so when warm. To prevent this the cotton is protected by its rubber enclosure in a new tire. But in use the tire is continually exposed to abrasion and accidents of the road such as contact with sharp

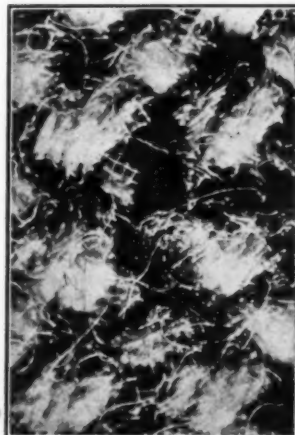


FIG. 2—SECTION OF A TORON-TREATED FABRIC TIRE.

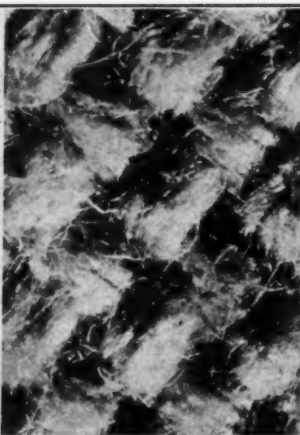


FIG. 3—SECTION OF A GRAY GOODS FABRIC TIRE.

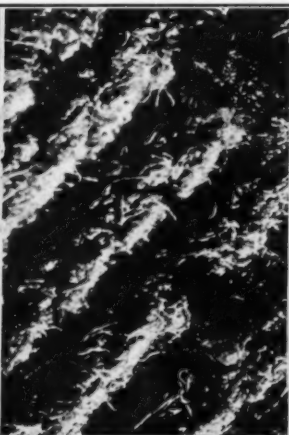


FIG. 4—SECTION OF A TORON-TREATED CORD TIRE.

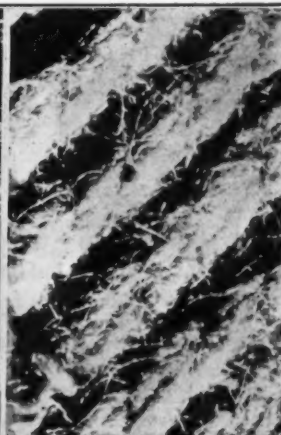


FIG. 5—SECTION OF A GRAY GOODS CORD TIRE.

BLACK SHOWS THE RUBBER, WHITE SHOWS THE THREAD. MAGNIFIED 14 DIAMETERS.

becomes unnecessary and this expense is eliminated, moreover, the friction is greatly increased. From actual tests of fabric tires built by the same maker and of identical construction except that one was built of untreated gray goods, while the other was built

¹ Laboratory of W. B. Pratt, Inc., Boston, Massachusetts.

edges, which may cut into the fabric or cord foundation, and through such perforations may enter air, moisture, dirt and organic germs such as the spores of moulds. Dirt acts as an abrasive. Air with moisture brings about oxidation and the moulds as they grow in a moist warm atmosphere rot the cotton. Warmth is

ensured by the heat generated through the friction of the tire in use. Moisture, either that left in the tire in manufacture or entering through punctures in the manner described, cannot be readily removed. Hence, though a structure built up on a cotton foundation and enclosed in rubber may be proof against oxidation and rotting from the action of the agents above enumerated, so long as it is enclosed in the rubber, yet it ceases to be thus protected as soon as the rubber covering is perforated or punctured.

It is otherwise, however, with toron-treated cotton, for every fiber is individually protected from contact with air, moisture or the effects of moulds. Neither moisture left in the tire structure by imperfections of manufacture or that which finds its way into the interior of the tire through perforations can reach the cotton through its envelope.

Another cause of rotting in tires is found in the sulphur coming from the vulcanized rubber. It is known that vulcanized rubber not infrequently shows a "bloom" due to some of the sulphur used for vulcanizing the rubber appearing on its surface, and through the oxidation of this sulphur in the presence of moisture and warmth, sulphur acids are formed which attack and weaken the cotton. Toron or toron-treated cotton does not bloom. Material treated with it reduces the likelihood of moisture, which might cause such oxidation of sulphur being left in the interior of the tire. And toron-treated cotton fiber is immune from attack from such sulphur acids as are formed within the tire.

VULCANIZING RUBBER TO SOLID TIRE RIMS.

An additional and very valuable characteristic of toron is that by its use rubber may be vulcanized to iron, thereby producing a complete adhesion of a solid tire to the rim of the wheel.

It is well known that rubber, whether vulcanized or not, does not adhere to iron and advantage is universally taken of this fact to vulcanize rubber articles in iron molds, yet, by a simple treatment of the rim surface with toron, on application of the rubber to this treated surface and its vulcanization, a bond is formed which resists rupture more than any other part of the tire, and thus one of the most serious defects in solid tire construction has been overcome.

NATIONAL ASSOCIATION OF WASTE MATERIAL DEALERS, STANDARD CLASSIFICATION FOR SCRAP RUBBER.

CIRCULAR F.

THIS STANDARD OF PACKING was adopted by the Scrap Rubber Division and approved by the Board of Directors of the Association on June 30, 1920, to be effective from July 1, 1920, to July 1, 1921, at which date a new circular will be issued.

All goods bought or sold under the following specifications are understood to consist only of domestic or Canadian manufacture, unless otherwise stipulated. All grades of scrap rubber shall be bought and paid for net weight, mill weights to govern, and no allowance for bagging or covering of any kind shall be made, nor shall the same be returned to the seller.

DELIVERY.

A.—All shipments of scrap rubber must be contained in bags, bales, bundles or other suitable containers, and if shipped loose a charge of ¼-cent per pound shall be made for extra handling, except automobile tires and railroad hose which may be shipped loose.

B.—A carload unless otherwise specified shall consist of fifteen tons. A ton when applied to domestic stock shall mean 2,000 pounds. A ton when applied to foreign stock shall mean 2,240 pounds.

C.—Shipments direct to a mill shall consist of not less than 2,000 pounds. Otherwise a charge of ¼-cent per pound shall be made.

D.—All scrap rubber of foreign manufacture shall be bought C. I. F. port of entry as per weight determined by sworn weigher's certificate, seller to bear expense of weighing, and shall be subject to same conditions as govern purchases of domestic manufacture.

REJECTIONS.

E.—Upon his request all rejections shall be returnable to the seller within thirty days from the time notice of rejection is received by him and upon payment by him of ½-cent per pound to cover cost of sorting and rebaling. If shipping instructions are not furnished within the above-mentioned thirty days the purchaser shall be at liberty to make such disposition of the material as he may see fit. The above does not apply if rejected material is purchased by the buyer.

F.—When shipments are made direct to a mill each grade of scrap rubber must be packed separately, and if not so packed a handling charge of ½-cent per pound will be made.

G.—All scrap rubber must be dry and free from dirt. All scrap received wet may be dried by the buyer, such shipments to be paid for on the dry weight as ascertained.

H.—A purchase contract shall not be considered filled until the full quantity within 2½ per cent, more or less, net weight, shall have been received, any rejections to be replaced within thirty days of the date of notice of rejection to the shipper.

EMBARGO.

I.—If through embargo a delivery cannot be made at the time specified the contract shall remain valid and shall be completed immediately on the lifting of the embargo, and terms of said contract shall not be changed. Notice of embargo must be served by seller.

CODE WORDS APPEAR IN ITALICS.

1.—**Rubber Boots and Shoes (Acce)**. Deliveries of rubber boots and shoes must consist of black rubber boots and shoes only. They must be dry and clean, free from dirt and leather, and all metal excepting that applied by the manufacturer.

1.—(a)—**Colored Rubber Boots and Shoes (Auto)**. Must consist of red, white and tan, and fancy colors, and must be packed and sold separately. The grading and packing to conform to Article 1.

2.—**Trimmed Arctics (Band)**. Must be closely trimmed and free from leather and any composite non-rubber bearing material, such as fiber, inner soles, etc.

2.—(a)—**Untrimmed Arctics (Bird)**. Must be free from leather and any composite non-rubber bearing material, such as fiber inner soles, etc.

3.—**Trimmed Tennis Shoes (Clam)**. Must be black; closely trimmed; free from molded soles and leather, or any composite non-rubber bearing material such as fiber inner soles, etc.

3.—(a)—**Untrimmed Tennis Shoes (Cool)**. Must be black and free from leather and molded soles or any composite non-rubber bearing material, such as fiber inner soles, etc.

4.—**Mixed Standard Auto Tires (Dirk)**. Must be free from the following: unguaranteed tires; heavy beaded tires; non-pneumatic or filled tires. Must not contain any hard, oxidized, burnt, single tube, motorcycle, stripped or badly worn tires, nor tires containing leather or metal.

5.—**Unguaranteed Auto Tires (Earl)**. Must be free from non-pneumatic or filled tires, heavy beaded tires, hard or oxidized, stripped, badly worn or tires with leather or metal.

6.—**Badly Worn Auto Tires (Farm)**. Must be free from hard or oxidized, non-pneumatic or filled tires, heavy beaded tires and tires with leather or metal. A reasonable proportion of the tread must be on the tires.

7.—**Stripped Auto Tires (Game)**. Must be free from hard or oxidized, non-pneumatic or filled tires, heavy beaded tires and tires with leather or metal.

8.—**No. 1 Auto Tire Peelings (Hawk)**. Must be free from cloth, metal and leather.

9.—**No. 2 Auto Tire Peelings (Lead)**. Must consist of peelings from auto tire treads only, and must be free from leather, metal, stripped, auto tire fabric, also free from beadless auto tires and free from dykes and side walls.

10.—**Bicycle Tires (Jade)**. Must be free from hard or oxidized tires and tires with wire and beads.

11.—**Solid Wagon and Cab Tires (Kite)**. Must be free from metal, baby carriage and cushion tires.

12.—**Solid Motor Truck Tires with Cloth (Lamp)**. Tires must be 2½ inches or over in diameter. Must be free from metal and tires with hard or fibre bases.

13.—**Clean Solid Motor Truck Tires (Life)**. Must consist of tires over 2½ inches in diameter. Must be free of all metal, hard bases, fiber and cloth bases.

14.—**Airbrake Hose (Mask)**. Must be free from metal, hard or oxidized hose and steam hose.

15.—**Garden Hose (Nail)**. Must be ½-inch, or over, in diameter and free from metal, rags, rope and cotton-covered hose.

16.—**Large Hose (Over)**. Large hose must be one inch or over in diameter. Must be free from metal, rags, rope, hard or oxidized hose and all cotton-covered hose.

17.—**Cotton-Covered Fire Hose (Park)**. Must be rubber lined and free from hard or oxidized hose, and metal.

18.—**No. 1 Auto Inner Tubes (Quiz)**. Must be strictly pure gum, live floating tubes, free from crusty tubes, cloth, metal, red and cloth patches, and free of black floating tubes.

19.—**No. 2 Auto Inner Tubes (Known as Compound Tubes) (Race)**. Must be standard tubes, free from crusty tubes, cloth, metal, and cloth patches.

20.—**Red Auto Inner Tubes (Utes)**. Must be standard tubes, free from punchings, crusty tubes, cloth, metal and cloth patches.

21.—**No. 1 White Rubber (Vase)**. Must consist of strictly clean white soft druggists' sundries and must be free from cloth and metal.

22.—**No. 2 White Rubber (Ward)**. Must consist of white mechanical rubber and to be free from cloth, metal, crusty, hard or oxidized material, white soles and heels, jar rings and cement wringers.

23.—**Mixed Black Rubber (Yoke)**. Must be free from cloth, metal, crusty, hard or oxidized material, packing, stripped matting, tiling, baby carriage tires, soles and heels.

24.—**Matting and Packing (Yarn)**. Must be free from Garlock, Crandall, and piston packing, belting and similar material, metal and hard or oxidized stock.

25.—**No. 1 Red Rubber (Yeast)**. Must consist of soft mechanical rubber. Must be free from maroon, chocolate, and other dark shades, also free from cloth and metal.

26.—**No. 2 Red Rubber (Yawl)**. Must be free from non-pneumatic or filled tires, heavy from jar rings, packing, hard or oxidized rubber, cloth, metal, soles and heels, and maroon and chocolate colored materials.

27.—**Red Packing (Zero)**. Must be free from hard or oxidized rubber, cloth and metal and discolored rubber and free from graphite packing.

War Department Specifications for Mechanical Rubber Goods—III.¹

WAR DEPARTMENT SPECIFICATIONS No. 333-1-1, frequently referred to in the following specifications, were published in THE INDIA RUBBER WORLD January 1, 1920.

RUBBER TRANSMISSION BELTING.

War Department Specification, No. 333-3-1—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR No. 8, P. S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(a) This specification covers the requirements for friction surface rubber belting to be used for power transmission.

(b) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods², which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(a) Seam in outside ply shall be filled with a rubber cord or beading, fastened down with a rubber cover strip about one-half inch wide.

BRANDING.—See General Specifications.

(a) Use word "Transmission."

MATERIAL.—See General Specifications.

(a) Cotton duck shall weigh at least 27.4 ounces per square yard.

INSPECTION.—See General Specifications.

(a) Inspector shall cut sample 12 inches long from belts four inches or under in width, four inches long from belts above four inches in width, from each roll of belting.

TESTS.—See General Specifications.

(a) **FABRIC.**—The warp must show a tensile strength not less than 260 pounds and the filler 170 pounds.

(b) **FRICTION.**—The friction shall be determined by stripping off two plies and separating them at the rate of one inch per minute. Additional test specimens shall be used for the alternate plies until all plies are tested. The average of all plies to be considered the friction strength, which shall not be less than 18 pounds for belting four inches wide and over and 17 pounds for belts less than four inches wide.

BALATA BELTING.

War Department Specification, No. 333-3-2—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR No. 8, P. S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(a) This specification covers the requirements for balata belting to be used for power transmission, elevator, and conveyor up to a temperature not exceeding 110 degrees F.

(b) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods², which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(a) The duck shall be thoroughly impregnated with balata.

BRANDING.—See General Specifications.

(a) Use the word "Balata." Brand with stencil.

MATERIAL.—See General Specifications.

(a) Cotton duck shall weigh not less than 29 ounces per square yard and have not less than 8-ply warp yarn and 5-ply filling yarn.

(b) The impregnating material shall be chemically neutral in character, permanently pliable, and free from any substance injurious to the untreated fabric, and unaffected by exposure to atmospheric conditions and water.

INSPECTION.—See General Specifications.

(a) Inspector shall cut off sample 12 inches long from belts four inches or under in width, four inches long from belts above four inches in width, from each roll of belting.

TESTS.—See General Specifications.

(a) **FABRIC.**—(a) The untreated duck shall have a tensile strength of at least 250 pounds in the warp and 200 pounds in the filling.

(b) The adhesion between the plies of fabric shall be determined by separating two plies at a time at the rate of one inch per minute. Additional test specimens shall be used for the alternate plies until all plies are tested. The average of all plies to be considered the adhesion strength, which shall be at least 12 pounds.

CORRUGATED TENDER HOSE.

War Department Specification, No. 333-1-13—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR No. 8, P. S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(a) This specification covers the requirements for hose for conducting water between tender and locomotive.

(b) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods², which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(a) Dimensions to conform with the following table.

(b) Made of an inner rubber tube; two plies of duck; a coil of galvanized or copperized wire extending within three inches of end of hose and thoroughly embedded in at least a 1/32-inch layer of rubber of same compound as tube; two plies of duck; and an outer rubber cover.

BRANDING.—See General Specifications.

(a) Use word "Tender."

MATERIAL.—See General Specifications and following table.

(a) Tube and friction shall be made of a rubber compound best adapted to resist the continued action of hot water and steam; the cover to resist water; abrasion, and other mechanical injuries.

INSPECTION.—See General Specifications.

(a) Inspector may select at random for tests one length from each and every shipment of 100 lengths or less. Tests shall be performed on samples taken from soft ends.

(b) If samples corresponding to any one lot fail to meet the requirements, the contracting officer may reject that lot or may, with the consent of the contractor, accept part or all of it at not more than 75 per cent of the contract price: Provided, however, that it does not fall below by more than 10 per cent of the requirements.

TESTS.—See General Specifications and following table.

TABLE.

	Size		
	2½	3	3½
	Inches	Inches	Inches
Tolerance, inside diameter, plus or minus.....inch	1/32	1/32	1/32
Outside diameter.....	3¼	3¾	4¼
Tolerance, outside diameter, plus or minus.....	1/8	1/8	1/8
Length, as specified in proposal.....	3/8	3/8	3/8
Length, tolerance, plus or minus.....	1/8	1/8	1/8
Thickness, tube and cover, minimum.....	1/8	1/8	1/8
Duck, plies, minimum.....	4	4	4
Weight (square yards), minimum.....	18	18	18
Wire diameter.....inches	0.120	0.120	0.120
Spacing maximum.....	¾	¾	¾
Thickness of rubber liner, minimum.....	1/32	1/32	1/32
Friction, minimum.....pounds	15	15	15
Tensile:			
Tube, minimum.....	500	500	500
Cover, minimum.....	450	450	450
Ultimate elongation, tube and cover, minimum.....inches	2-6	2-6	2-6

RADIATOR HOSE.

War Department Specification, No. 333-1-9—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR No. 8, P. S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(a) This specification covers the requirements for hose to be used between radiator and engine.

(b) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods², which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(a) Dimensions to conform with the following table.

(b) No couplings.

BRANDING.—See General Specifications.

(a) Use word "Radiator."

MATERIAL.—See General Specifications and following table.

(a) Tube and friction shall be composed of a steam-resisting compound; cover of an oil-resisting compound.

INSPECTION.—See General Specifications.

(a) Inspector may select at random four 3-foot sections from each and every shipment of 2,000 feet or less. Two samples to be used for steaming, two for oil tests.

TESTS.—See General Specifications and following table.

(a) Test specimens shall not be buffed.

(b) In calculating the tensile strength after steaming and oil tests, the thickness of test specimen shall be considered as equal to that of the original test specimens.

(c) **STEAMING.**—Steam at 45 pounds pressure to be passed through a 2-foot section for eight hours. (Hose to be provided with open drain cocks to prevent filling with condensation.)

¹Continued from THE INDIA RUBBER WORLD, July 1, 1920, pages 649-651.
²See THE INDIA RUBBER WORLD, January 1, 1920, page 214.

(d) OIL.—One-foot section, with both ends plugged, shall be immersed for 48 hours in medium gas engine cylinder oil between 70 degrees and 80 degrees F. and immediately wiped clean before resting. Test pieces to be cut at least four inches from either end.

TABLE.

Thickness:	Size, as Specified.
Tube, minimum	inch $\frac{1}{8}$
Cover, minimum	$\frac{1}{16}$
Tensile:	
Original tube and cover, minimum	pounds 600
After steaming tube, minimum	400
After immersed in oil, cover, minimum	400
Ultimate elongation:	
Original tube and cover, minimum	inches 2-6
After steaming tube, minimum	2-5
After immersed in oil, cover, minimum	2-5
Friction:	
Before steaming, minimum	pounds 15
After steaming, minimum	10
Fabric:	
Weight per square yard, minimum	ounces 10.8
Number of plies 2 inches and under, minimum	3
Number of plies over 2 inches, minimum	4

DIVERS' HOSE.

War Department Specification, No. 333-1-6—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR No. 8, P. S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(a) This specification covers the requirements for hose to be used for conducting air in diving apparatus.

(b) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods², which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(a) The cotton reinforcement shall consist of three braided layers, well embedded in the rubber compound to meet all tests described below.

(b) Dimensions to conform with the following table.

(c) The washers shall be of leather, 1/16-inch in thickness.

(d) Each length shall have a rubber cap at least 1/16-inch thick.

BRANDING.—See General Specifications.

(a) Use the word "Divers."

MATERIAL.—See General Specifications.

(a) Tube and cover shall contain not less than 30 per cent fine Pará rubber, not more than 2½ per cent sulphur, nor more than 1½ per cent waxy hydrocarbon, with the remainder suitable dry, inorganic mineral fillers.

INSPECTION.—See General Specifications.

(a) The inspector shall cut a 3-foot section from one length out of every lot of ten (50-foot lengths) or less; or take one in every 50 short lengths for test.

(b) For each lot of fifty 3-foot lengths one extra length shall be furnished for test purposes.

TESTS.—See General Specifications.

(a) To conform with the following table.

(b) Constricted part of test specimen shall be ¼ by two inches.

	Size, ½-inch.
O. D. lengths	1½ inches, 3 or 50 feet.
Hydrostatic for couplings	250 pounds for 10 minutes.
Tests: burst	1,000 pounds.
Friction	20 pounds.
Tensile:	
Tube	1,200 pounds.
Cover	1,000 pounds.
Ultimate elongation:	
Tube	2 to 9 inches.
Cover	2 to 9 inches.
Stretch	2 to 7 inches.
Set	25 per cent (maximum).
Tolerance, plus or minus	¼ inch.

CHEMICAL ENGINE HOSE.

War Department Specification, No. 333-1-5—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR No. 8, P. S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(a) This specification covers the requirements for chemical engine hose for use with hand chemical fire extinguishers, and chemical engines.

(b) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods², which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(a) Dimensions to conform with the following table.

BRANDING.—See General Specifications.

(a) Branding to be black.

(b) Use the word "Chemical."

MATERIAL.—See General Specifications.

(a) Tube, cover, washers, and friction shall contain not less than 35 per cent fine Pará and not more than 3 per cent sulphur; the remainder to consist of suitable dry inorganic mineral fillers. The use of carbonates will not be permitted.

(b) Cover shall be red.

INSPECTION.—See General Specifications.

TESTS.—See General Specifications and following table.

(a) Test pieces of tube and cover shall be subjected to an accelerated aging test of 96 hours in dry heat at 158 degrees F., plus or minus 2 degrees.

TABLE.

	Size.			
	¾-Inch. 1/16	½-Inch. 1/16	¾-Inch. 1/16	1-Inch. 1/16
Tolerance (I. D.), plus or minus	inch $\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{32}$
Thickness:				
Tube, minimum	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$
Cover, minimum	$\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{32}$
Hydrostatic test:				
Coupling, minimum	150	150	150	150
Burst, minimum	500	500	500	500
Friction	15	15	15	15
Tensile:				
Tube, minimum	1,500	1,500	1,500	1,500
Cover, minimum	1,300	1,300	1,300	1,300
After aging:				
Tube, minimum	900	900	900	900
Cover, minimum	800	800	800	800
Ultimate elongation, minimum	2-11	2-11	2-11	2-11
Permanent set:				
Tube and cover, stretch for 10 minutes, then release, minimum	inches 2-10	2-10	2-10	2-10
Per cent set after 10 minute rest, maximum	25	25	25	25

GAS HOSE.

(A) ACETYLENE-HYDROGEN HOSE. (B) OXYGEN HOSE.

War Department Specification, No. 333-1-2—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR No. 8, P. S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(a) This specification covers the requirements for hose to be used in carrying acetylene, oxygen, and hydrogen gas.

(b) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods², which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

(a) DIMENSIONS.—See the following table.

(b) Rubber cover shall be red for acetylene-hydrogen hose; black for oxygen hose.

BRANDING.—See General Specifications.

(a) The red covered hose shall have black brands.

(b) For acetylene-hydrogen hose use the letters "ACET-HYD," for oxygen the letters "OXY."

MATERIAL.—See General Specifications.

(a) The fabric plies shall be of sheeting or a plain weave fabric.

INSPECTION.—See General Specifications.

TESTS.—See General Specifications and following table.

TABLE.

Size	Inches $\frac{1}{8}$, plus or minus $\frac{1}{32}$
Outside diameter	$\frac{1}{8}$, plus or minus $\frac{1}{32}$
Thickness:	
Cover	2/32
Tensile:	
Tube, minimum	pounds 500
Cover, minimum	450
Ultimate elongation:	
Tube and cover, minimum	inches 2-6
Friction minimum	pounds 9
Hydrostatic:	
Coupling, minimum	250
Burst, minimum	500

DREDGING SLEEVES.

War Department Specification, No. 333-1-4—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR No. 8, P. S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(a) This specification covers the requirements for dredging sleeves to be used on hydraulic dredges.

(b) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods², which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(a) Sleeves shall consist of a rubber tube, cotton canvas layers, and rubber cover.

(b) Between the center plies there shall be a 1/32-inch layer of rubber compound. See General Specification.

(c) Ends to be capped with same rubber compound as in the tube.

²See THE INDIA RUBBER WORLD, January 1, 1920, page 214.

(d) Over the rubber cover for a distance of six inches from each end there shall be vulcanized a strip of duck same as that used in canvas layers.

(e) DIMENSIONS.—See the following table.

BRANDING.—See General Specifications.

(a) Use words "Dredging Sleeves."

MATERIAL.—See General Specifications.

(a) Cotton canvas layers shall be made from duck weighing not less than 30 ounces per square yard and containing not less than 13 nor more than 20 yarns per inch each in warp and filling.

INSPECTION.—See General Specifications.

(a) With each lot of 10 sleeves or less the manufacturer shall provide the inspector for test a sample $1\frac{1}{2}$ inches wide of same material and construction, made up with the sleeve, at one end, but detached so as not to impair the finished sleeve. Manufacturer shall submit one lineal foot of unfriictioned duck with each order.

(b) If samples corresponding to any one lot of sleeves fail to meet the tests, the contracting officer may reject the lot or may, with the consent of the contractor, accept part or all of it at not more than 75 per cent of the contract price, provided, however, that it does not fall below by more than 10 per cent of the test.

TESTS.—See General Specifications and following table.

(a) Test specimens of tube shall be buffed down to approximately $\frac{1}{8}$ -inch.

TABLE.

Size and Length, as Specified in Proposal.

Tolerances:	
Diameters, plus or minus.....inches	$\frac{3}{16}$
Length, plus or minus.....	$\frac{1}{2}$
Thicknesses:	
Tube, minimum.....	$\frac{3}{16}$
Cover.....	$\frac{1}{8}$
Cap.....	$\frac{1}{16}$
Rubber layer between center plies, minimum.....	$\frac{1}{16}$
Fabric, per square yard.....	30
Flies, as specified in proposal.....	
Tensile, minimum—	
Warp.....pounds	250
Filling.....	250
Friction.....	18
Tensile:	
Tube.....	1,500
Cover.....	1,300
Ultimate elongation:	
Tube.....inches	2-12
Cover.....	2-12
Permanent set.....	
Stretch for 10 minutes then release.....	
Tube.....	2-10
Cover.....	2-10
Per cent set after 10 minutes rest:	
Tube.....maximum	25
Cover.....	25

RED SHEET PACKING.

War Department Specification, No. 333-2-3—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR No. 8, P. S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(a) This specification covers the requirements for red sheet packing to be used in joints in connection with cold water, hot water, and steam up to and including 150 pounds pressure.

(b) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods², which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(a) Packing shall be in rolls about 36 inches wide, approximately 125 pounds in weight and of thickness specified.

BRANDING.—See General Specifications.

(a) Use the words "Red Sheet."

MATERIALS.—See General Specifications.

(a) Packing shall be of a specific gravity not less than 1.8 nor more than 2.2, which is equivalent to not less than 2.65 pounds nor more than 3.23 pounds per square yard for each $1/32$ -inch of thickness.

INSPECTION.—See General Specifications.

TESTS.—See General Specifications.

(a) Tensile specimens may be taken in any direction.

(b) Tensile strength, minimum, 500 pounds.

Ultimate elongation, minimum, two to four inches.

Ultimate elongation, maximum, two to seven inches.

(c) Packing shall not crack when bent double in any direction.

(d) A section of packing shall be cut in the form of a gasket such that it will entirely cover the seat of a 2-inch flange of an autoclave. A steel plate the size of the flange shall then be securely clamped over the gasket. It shall then be exposed to a steam pressure of 250 pounds per square inch for four hours.

After the sample has been removed from the flange of the autoclave it shall be allowed to cool for one hour, after which packing under $1/8$ -inch thick shall not crack if bent double in any direction and packing $1/8$ -inch and over in thickness shall not crack if bent around a $1/2$ -inch round mandrel.

TUCK'S PACKING.

War Department Specification, No. 333-2-4—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR No. 8, P. S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(a) This packing is to be used as stuffing-box backing on pistons in pumps and engines.

(b) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods², which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(a) Tuck's packing shall consist of frictioned cotton canvas layers either round or square, as specified. The round packing shall be made with a rubber core, unless otherwise specified.

(b) It shall be built up on the bias and shall conform in dimensions, plies, and textures to the following table:

Sizes.	$\frac{3}{4}$ to $\frac{1}{2}$ -inch.	$\frac{1}{2}$ to $\frac{3}{4}$ -inch.	1 inch and over.
Texture of plies.....	Fine.....	Medium.....	Coarse
Number of plies per inch, including friction.....	38 to 42.....	26 to 30.....	15 to 17.

(c) The rubber core shall have a diameter equal to one-third the diameter of packing.

BRANDING.—Not required.

MATERIALS.—See General Specifications.

(a) The rubber core shall contain not less than 35 per cent fine Pará rubber; not more than three per cent sulphur, and the remainder shall consist of suitable dry inorganic mineral fillers.

(b) Friction shall be of such a compound as to meet required tests.

INSPECTION.—See General Specifications.

(a) A section six inches long shall be cut from any length at any place to allow for four or more tests.

TESTS.—See General Specifications.

(a) The completed article shall withstand boiling in water under 80 pounds' steam pressure for four hours without loosening the friction or materially hardening the rubber.

(b) Packing shall be sufficiently flexible to admit of bending easily around rods or pistons of various sizes. The $1/4$ to $3/4$ -inch shall bend around its diameter, the $7/8$ to $1\frac{1}{8}$ -inch around twice its diameter, and the larger sizes around three times their diameter.

(c) Friction shall be such that a weight of 8 pounds shall not cause a separation greater than 1 inch per minute, calculated upon a basis of a 1-inch specimen.

(d) Tensile strength of the rubber core shall be at least 900 pounds per square inch, and it shall have an elongation at the breaking point of at least two to eight inches.

DIAPHRAGM PACKING.

War Department Specification, No. 333-2-2—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR No. 8, P. S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(a) This packing is to be used for making diaphragms for diaphragm pumps.

(b) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods², which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(a) The packing shall be in sheets approximately 36 inches wide and made into rolls of about 125 pounds each. It shall be constructed of two layers of cotton fabric using a layer of rubber between them and a layer of rubber on each side, making alternate layers of rubber and fabric.

The rubber layer which separates the plies of duck shall be $1/16$ -inch thick. The outer rubber layers shall be equal in thickness, but of such a thickness to make the total thickness of the packing $1/4$ -inch.

(b) The cotton canvas plies shall be frictioned on both sides with the same quality material as used in the rubber compound and shall withstand the friction test mentioned below.

BRANDING.—See General Specifications.

(a) Use the word "Diaphragm."

²See THE INDIA RUBBER WORLD, January 1, 1920, page 214.

MATERIAL.—See General Specifications.

(a) Fabric shall weigh not less than 12 ounces per square yard.

(b) The rubber compound shall contain not less than 40 per cent of fine Pará; not more than 3 1/2 per cent sulphur; remainder to be suitable dry inorganic mineral fillers.

INSPECTION.—See General Specifications.

TESTS.—See General Specifications.

(a) Fabric:

Tensile, minimum—

Warp 125 pounds.

Filling 125 pounds.

Yards per inch each, warp and filling 22, plus or minus 4.

(b) Friction, minimum 14 pounds.

(c) Tensile rubber layers, minimum 1,800 pounds.

(d) Ultimate elongation, minimum 2 to 11 inches.

(e) Permanent set—

Stretch for 10 minutes, minimum 2 to 9 inches.

Set after 10 minutes' rest, maximum 25 per cent.

CLOTH INSERTION RUBBER PACKING.

War Department Specification, No. 333-2-1—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR No. 8, P. S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(a) This specification covers requirements for grade I packing used in flanges of ventilation systems or in flanges in contact with cold water which are separated only at long intervals; grade II packing used in flanges in contact with cold water which are separated frequently.

(b) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods², which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(a) To consist of alternate layers of rubber and cotton sheeting or a plain weave fabric in such a manner that both faces of packing shall be of rubber.

(b) Made about 36 inches wide, and in rolls weighing approximately 125 pounds, unless otherwise specified.

(c) Cotton insertion shall be properly frictioned with a composition to meet required tests.

(d) For every 1/16-inch thickness there shall be at least one ply of cotton sheeting or a plain weave fabric.

(e) 1/32-inch packing shall have only one ply of insertion and shall be furnished in grade II only. Grade I shall be furnished in thickness 1/16-inch and above.

BRANDING.—See General Specifications.

(a) Use the words "Water, Grade I" or "Water, Grade II," as specified in proposal.

MATERIALS.—See General Specifications.

(a) Fabric to weigh not less than 4.75 ounces nor more than 5.15 ounces per square yard, count to be 35 to 50 threads per inch for both warp and filling directions.

(b) All rubber layers to be of the same composition.

INSPECTION.—See General Specifications.

TESTS.—See General Specifications.

(a) GRADE I:

Friction adhesion between rubber layers and fabric insertions, minimum	7
Tensile of rubber layers, minimum	1,000
Ultimate elongation, minimum	2-11
Permanent set:	
Stretch for 10 minutes, minimum	2-10
Set after 10 minutes' rest, maximum	20

(b) GRADE II.—One-sixteenth-inch complete packing shall weigh not less than five or more than six pounds per square yard, and other thicknesses in same proportion. Packing weighing over six pounds per square yard may be rejected, or accepted with payments based on area corresponding to 6 pounds per square yard.

Shall be pliable enough to stand bending double in any direction without cracking.

A 4-inch square of packing shall be placed in the water of an autoclave. Another section shall be placed on flange of autoclave with steel plate clamped on so as to cover the entire pieces of packing. The autoclave shall be heated to give an internal steam pressure of 50 pounds per square inch for four hours. Both sections shall be allowed to rest one hour after removing from autoclave, after which they shall show no blisters or other apparent injury. Packing under 1/8-inch thick shall not crack when bent double; packing 1/8-inch and over in thickness shall not crack when bent around 1/4-inch round mandrel.

RUBBER VALVES.

War Department Specification, No. 335-1-2—June 5, 1919.

(AUTHORITY OF SUPPLY CIRCULAR No. 8, P. S. & T. DIV., JANUARY 24, 1919.)

GENERAL.—(a) This specification covers the requirements for valves used in pumps, condensers, etc.

²See THE INDIA RUBBER WORLD, January 1, 1920, page 214.

(b) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods², which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(a) The valve surfaces shall be smooth and free from pitting, air checks, other imperfections, and properly finished. They shall be hard, medium, and soft, as required.

BRANDING.—See General Specifications.

(a) Valves shall be molded with the words "U. S. A.," "Hard," "Medium," or "Soft," manufacturer's name, and date on edge of valve.

MATERIAL.—See General Specifications.

(a) Valves shall be made from a compound containing fine Pará rubber, sulphur, and suitable dry inorganic fillers, as specified in table below:

	Minimum percentage fine Pará.	Total sulphur.	Specific gravity.	
			Minimum.	Maximum.
Hard	30	10	1.7	1.9
Medium	35	5	1.4	1.8
Soft	35	2.5	1.6	1.8

INSPECTION.—See General Specifications.

(a) Inspector shall select one valve from every lot for tests.

TESTS.—See General Specifications.

(a) Half a valve taken at random from the lot shall stand a dry-heat test 270 degrees F. for one hour; the other half from same valve shall stand a dry saturated steam test of 400 degrees F. for three hours. The valves shall not disintegrate nor blister in either of the above tests.

SOLIDS PLUS PNEUMATICS.

Commenting on a caption of frequent occurrence in motor papers, F. R. Fageol, of the Fageol Motors Co., Oakland, California, asserts in "Automotive Industries" that it should read "Solids Plus Pneumatics" rather than "Solids vs. Pneumatics." Pointing out that both types of tires have their own peculiar functions, and that both are undoubtedly here to stay, he very aptly asserts that pneumatic tires will not run solids out of business, but will simply run trucks into more business. At present and apparently for some time to come pneumatics can no more displace solids than can trains displace boats.

From the truck manufacturer's point of view, pneumatics merely extend the range of truck transportation beyond the field developed on solids. Most tire manufacturers produce both types. Thus there are occasions for comparison, but very little conflict.

For slow-moving heavy loads in congested traffic, it is hard to conceive anything more satisfactory than the solid rubber truck tire, but it will not withstand long continuous use at high speed as do pneumatics. In the past there was no need of speed in trucking, and neither trucks nor roads were built for it. With lagging transportation facilities now the most serious problem before the world, however, the efficiency of all known transportation agencies must be increased, and neither truck load nor road will withstand the shocks and vibration of high speed unless cushioned by pneumatics.

Roads are being built to meet present-day needs, and pneumatic cord tires have enabled truck manufacturers to develop transmissions and other improvements to increase speed and economical hauling radius. The modern seven-speed truck transmission, for example, gives an over-drive for speed of thirty miles an hour on the open road, together with an extremely low reduction for steep grades on unusually heavy going. Pneumatic tires also afford traction under certain unfavorable conditions that render truck operation on solids very difficult. Sand, loose dirt, and mud seem to hold no terrors for the pneumatic.

Many claims of savings in operation costs, such as fuel consumption and general repairs when pneumatics replace solids, are being made, but these are entirely beside the point. Pneumatics do increase the usefulness of the motor truck and that is the real issue. They do not supplant solids, but bring into truck range an entirely new class of business heretofore necessarily handled by some less satisfactory means.

What the Rubber Chemists Are Doing.

THE COLLOIDAL VIEWPOINT OF RUBBER CHEMISTRY.¹

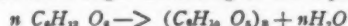
THIS PAPER is divided into two main topics. The first is an analysis of the mechanism by which the particles increase or decrease in size in rubber and other colloidal systems. Under this head crystallization, condensation, polymerization and coagulation will be discussed. The second topic is concerned with some applications of selective adsorption to rubber.

CRYSTALLIZATION.

For the present purpose little need be said of the process known as crystallization except with regard to a single phase of this phenomenon. For instance, when very dilute solutions of gold chloride are treated with weak reducing agents, microscopic nuclei are formed from which colloidal crystals of gold may be made to grow, if the reducing action is kept sufficiently low, so that the molecules of gold have time to become orientated on the crystal faces. Here the growth of the particles occurs by a purely crystallization process, and will cease as soon as the supply of molecular gold or reducing agent is exhausted.

CONDENSATION.

The term condensation is often employed in a somewhat loose sense. Strictly speaking it refers to an increase in the size of the particles through the agency of a chemical change, whereby two or more molecules unite by the splitting off of water or other substance. A classical example is the formation of starch from sugar according to the equation



POLYMERIZATION.

Polymerization is another well-known method involving the growth of particles. This phenomenon differs from condensation only by the fact that nothing is split off when two or more molecules unite to form a larger complex. The molecular weight of the complex is, therefore, n times that of the original substance if n represents the number of molecules that have united to form the new and larger unit. Organic chemistry is replete with examples of this kind of chemical action. For instance the change of the aldehydes into the para or meta modifications belongs in this category. From the evidence at hand it seems very probable that in polymerization the redistribution of major valencies is involved, because those substances which exhibit this property to a pronounced degree are possessed of double bonds.

It should be emphasized in connection with a discussion of condensation and polymerization that these two types of changes are essentially chemical in the strictest sense of the term. The products of these two reactions have properties very different from the original, and the alterations of properties are sudden, not gradual.

COAGULATION.

Coagulation, in contradistinction to condensation or polymerization, involves a gradual change of properties and there is no sharp line of demarcation between the original and the final substance. Unfortunately, the term is employed to designate four distinctly different physical processes.

The first of these is well illustrated by the union of the colloidal gold crystals referred to in a previous paragraph. If during the growth of these tiny crystals the process is hurried, or if an electrolyte is added to the colloidal solution, several of the tiny crystals unite by surface contact, a loose mass is formed and eventually a powder will be precipitated.

This is, of course, an irreversible process and is a typical example of coagulation. It should be noted, however, that the particles touch the surface of one another and do not flow together.

A second form of coagulation is manifested when, for example, the particles of an oil-in-water system gather together. Here the tiny droplets touch one another, flow into a larger drop which finally rises to the top or sinks to the bottom, according to the differences in the specific gravity of the two phases. This kind of coagulation is distinguished from all others in that the resulting products are two distinct, molecularly dispersed and therefore homogeneous phases. There is no colloidal oil dispersed in the water, nor yet is there any colloidal water in the oil.

A third type is exemplified by the coagulation of gelatin in a hydrosol by an excess of an electrolyte, whereby a flocculent and perhaps a somewhat stringy mass is obtained. It is conceded by most writers that the electrolyte to a large extent desolvates the gelatin, that the particles are at first actually reduced in size because of the loss of solvent, but that the desolvated particles unite to form larger clumps which appear as flocks.

There is also another possibility that should not be overlooked. Not only may the particles unite and flow together, but the molecules of which these particles are composed may unite chemically to some extent and form a polymerized substance. In such a case we should have both a chemical and physical reaction going on simultaneously or subsequently to each other. It is altogether probable that in the coagulation of rubber latex where an elastic mass is formed, there occurs both a physical union between the particles and polymerization between the molecules in these particles. It is quite conceivable that these two reactions might proceed to a different degree in the same system under slightly different conditions. If this were true we should not expect the two products to have identical properties. This may explain why two samples of raw rubber from the same latex may differ materially from each other if the conditions during coagulation are varied in the two cases.

GELATION.

A fourth physical change, that of gelation, is usually referred to as coagulation. When a sufficiently concentrated solution of gelatin in water is allowed to cool the entire mass sets as a gel. The process in this case is the reverse of number three previously described. As the cooling proceeds the particles become more and more solvated, the size of the particles increases until they touch one another and the gelatin eventually forms the continuous phase, while the water is now dispersed in the gelatin. This phenomenon is known as a reversal of phase. Gels may be formed by evaporating off the solvent, and here the same reversal of phase may occur. It is also not impossible that polymerization may take place during the formation of a gel by either of these processes.

CHARACTERISTICS OF GELATION.

Gelation differs from the three previously mentioned forms of coagulation because in a gel both the disperse phase and the disperse medium are coextensive throughout the entire mass. This expression is employed in preference to the term homogeneous because the latter has a well-defined thermodynamic meaning. Homogeneous solutions contain a solute in a molecular state of subdivision and exhibit a lowering of the freezing point or raising of the boiling point from which molecular weights may be calculated. Gels are coextensive

¹Published by courtesy of the American Chemical Society. Paper by Ellwood B. Spear, chemical department, Massachusetts Institute of Technology, read at the St. Louis meeting, April, 1920.

in the sense that every submicroscopic portion contains both the solute and the solvent.

Caoutchouc dissolved in benzol may be separated from the solvent either by the addition of acetone or by the evaporation of the benzol. In the first case a lumpy, stringy mass is obtained, doubtless because the acetone desolvates the raw rubber. In other words, the acetone robs the caoutchouc of its benzol, the particles are attracted to one another and therefore coagulate in masses or flocks. When, however, the benzol is removed slowly by evaporation the particles are forced closer and closer together as desolvation proceeds. Finally they touch, flow into one another and a single coextensive mass is formed. Just as in the case of gelatin, it is quite possible that polymerization occurs during the coagulation.

In accordance with this point of view an elastic rubber mass is a coagulum permeated with capillaries, the walls of which are made up of more or less polymerized particles of different sizes stuck together at several portions of their surfaces. If a solvent is introduced the particles become solvated and separate into submicrons that differ greatly in size. Moreover, if polymerization occurs during coagulation it naturally follows that depolymerization must take place while dissolution is in progress.

This same increase in dispersion and possibly depolymerization may be brought about by other agencies than solvents. Mechanical work and rise of temperature have this effect to a marked degree. Doubtless the function of "milling" is precisely of this nature, but whether the paramount change is chemical depolymerization or merely a physical reduction in the size of the particles cannot be decided at present. It seems very probable that both occur at the same time. It is of interest to note in this connection that a tire on the road is being constantly subjected to a milling treatment which should tend to depolymerize and decrease the size of the particles. This effect should be offset wholly or in part by a slow vulcanization in case free sulphur is present, because the temperature rise in a tire under load is often very considerable.

The subject of coagulation and the antithesis, dispersion, should not be dismissed without reference to the important part these reactions play in the preparation of such compounding materials as zinc oxide, gas black and sublimed lead. A recent article on carbon black by Perrott and Thiesen,² makes it quite clear that not only the size of the particles but also the structure is vital. Both of these are without doubt influenced by the method of preparation.

SELECTIVE ADSORPTION.

Selective adsorption, the second topic of this paper, is a colloidal conception that promises to become more and more useful as it is better understood. By the term is meant that certain substances mutually attract each other with very considerable force, although no chemical action according to the law of definite proportions may result. When the substances are microscopic in size this attraction is called adhesion, but if one or both are of colloidal dimensions the term adsorption is applied. May it not be that this phenomenon is the vital factor in the compounding of rubber? Certainly on purely chemical grounds we cannot account for the very great change of properties occasioned by the mixing of gas black with raw rubber, nor yet for the fact that oil black is not so efficacious as gas black. Selective adsorption, on the other hand, predicts very pronounced differences of behavior between substances having the identical chemical composition but a different physical structure. In order that carbon black may be adsorbed by raw rubber to the greatest

degree and with the strongest bonds, the former must be in a very fine state of division, and doubtless the particles must have a particular structure. These conditions are not met so well by the oil black as they are by the gas black.

This theory also predicts other important facts familiar to the rubber chemist. For example, it ought to be possible to substitute for carbon other substances which are in a suitable physical state. The determining factor is whether or not the compounding material and rubber mutually adsorb each other to a high degree. This is doubtless the reason that zinc oxide may be employed instead of gas black.

Many other systems are known where mutual adsorption changes the properties fundamentally. As an instance may be cited a mixture of sand and mud, or clay. Roads made of either of these materials alone are nearly impassable, but if the two are mixed in the right proportions very fair surfaces result.

CONCLUSION.

From the colloidal point of view the particles of the compounding material of a compounded vulcanized rubber mass are surrounded by a thin film of rubber. The latter is therefore the continuous phase and is held securely to the surface of the compounding material by the forces of adsorption. Not only will the rubber films offer resistance to efforts tending to deform the mass, but the particles of the compounding material hold the films of the rubber so firmly that the resistance is greatly increased. A good example of this last action is shown by the surfaces of two glass plates which have been wet and brought together. As long as the plates are not very close they can be moved across each other with ease. When, however, the surfaces are pressed together so that the water forms a thin film between them, the adsorption forces become so strong that the plates may be moved in different directions only with great difficulty.

CARBON BLACK.

The following interesting facts are taken from an address delivered before the National Association of Printing Ink Manufacturers by Godfrey L. Cabot, a well-known manufacturer of carbon black.

PRODUCTION.

The makers of carbon black are straining every nerve and have been making the utmost effort for several years to increase their output, and it has greatly increased. In 1915 The B. F. Goodrich Co. made the remarkable discovery that carbon black incorporated in rubber increased its tensile strength fifteenfold, giving it greater tractile effect on a smooth and slippery pavement, less wear and afforded greater resistance to the oxidizing effect of the atmosphere than any other material yet tried for these purposes. The result was that the demand for carbon black increased more than twofold, and more than half the carbon black now made is used in the rubber trade, and the amount available is not enough to satisfy it.

Many different causes have increased the difficulties of supplying the demand for carbon black. During the war pressure was brought to bear by the Fuel Administration to divert gas from its use in the manufacture of carbon black to use for fuel, and two factories have been shut down in part by this pressure.

The great scarcity of steel, its high price and the difficulties of transportation have greatly enhanced the expense and difficulty of building black factories, and it is difficult, expensive and tedious to get such material to-day.

Many of you have probably noticed old signs on country roads that had been painted in black on a background of white lead, and this in turn on a wooden board—the white lead almost gone, the wood beneath it rotted away to a very appreciable extent, and the black lettering of the original sign standing out in bas relief by reason of its having protected the

²Journal of Industrial and Engineering Chemistry, xii, 324 (1920); THE INDIA RUBBER WORLD, June 1, 1920, 581, 582.

wood beneath it by prolonging the life of the oil with which it was mixed.

CARBON BLACK RETARDS OXIDATION.

The process of the drying of linseed oil and other drying oils is due to oxidation and is accompanied by an increase in weight. This oxidation process is more retarded by carbon black than by any other known pigment. Next to it comes lampblack, but carbon black retards the drying of paint even more than lampblack by retarding the oxidation of the oil. It seems to have a similar effect on retarding the oxidation and consequent deterioration of rubber.

INCREASES TENSILE STRENGTH OF RUBBER.

Samples of rubber compounded with carbon black have shown a tensile strength of 3,700 pounds per square inch.

COMPOSITION OF CARBON BLACK.

Carbon black is not carbon, and all analyses showing over 99 per cent of carbon in carbon black are erroneous and misleading. Probably all such analyses were based on the mere combustion of the carbon black and the assumption that everything that burned away was carbon. The lowest percentage of carbon in any competent carbon black analysis that I have ever seen was obtained in the case of the famous Peerless Black and this showed 80 per cent on the commercial substance and 85 per cent when it was dried at a temperature of 110 degrees C.

No one has yet shown what connection, if any, there is between the commercial qualities of a carbon black and its percentage of carbon; this is a very interesting field for research, well worthy of attention.

Carbon black is an amorphous mixture of hydrocarbons and other organic compounds, some of which contain oxygen, none of which have ever been isolated and of which the number is probably very great.

One important and striking fact with regard to the making of carbon black is that only a small portion of the weight of natural gas is obtainable as carbon black. It is true that by calcining gas one may obtain more soot, containing as a rule adamantine particles and amounting to 6 or 7 per cent of the weight of the gas and possibly in some instances to more than this, but the material thus obtained has never been made at a competitive price, and is unsalable at any price, owing to its poor color, deficiency of coloring power and usually the presence of grit. Nevertheless, I do not by any means maintain that this method may not ultimately become of great commercial importance. Hitherto, it has been conducted only on a small scale and at a prohibitory expense by reason of the small yield in proportion to the value of the apparatus employed and the rapid destruction of the apparatus by the methods of manufacture or the great expense of the apparatus relative to the yield.

PERCENTAGE OF RECOVERY FROM NATURAL GAS.

Thirty-three years ago the yield was believed to be from one to three pounds per thousand cubic feet, which would be less than 1/30 of the carbon content of the gas. At the present time in West Virginia from 1/20 to 1/30 of the carbon is recovered in the shape of carbon black under proper working conditions. The Louisiana gas is poor in quality and yields less than 1/30.

INFLUENCES INCREASING COST OF CARBON BLACK.

Carbon black makers have been harassed by legislation. In Louisiana such attempts have ceased after a period of activity.

In Wyoming a law has been passed forbidding the erection of carbon black factories within a certain distance from cities of a certain population, a regrettable and foolish law, which probably would not stand the decision of the Supreme Court of the United States; but, at any rate, it is a distinct deterrent to the manufacture of carbon black. In West Virginia many attempts have been made to pass adverse legislation, and a law has recently been passed taxing the transportation of natural gas, but it is not in force pending the decision of the Federal courts of last resort.

Another cause that has operated to increase the cost of carbon black is the increasing value of natural gas. For instance, at Clarksburg, West Virginia, six years ago, gas was sold to the glass makers at 4 cents a thousand. They are now paying 27 cents a thousand, and in Grafton, West Virginia, they are paying 33 cents a thousand.

CHEMICAL PATENTS. THE UNITED STATES.

PROCESS OF PREVENTING THE INNER WALLS OF RUBBER HOSE from sticking during manufacture, which consists in simultaneously applying to the inner and outer walls of an uncured inner tube a mixture of water and a powdered agent capable of being deposited upon the walls of the tube and preventing adhesion of the walls. (Frank C. Moore, Canton, Ohio. United States patent No. 1,344,143.)

PRINTING-ROLLER COMPOSITION. A resilient ink-distributing roller formed of a vulcanized composition comprising a mixture of previously vulcanized and previously unvulcanized rubbers in nearly equal proportions by weight and together constituting the greater part of the composition. (Abraham L. Freedlander, Akron, Ohio, assignor to The B. F. Goodrich Company, New York City, United States patent No. 1,344,631.)

METHOD OF TREATING FABRIC. This consists in first impregnating the fabric with an emulsified lubricating material and subsequently applying a vulcanizable plastic. (Erwin E. A. G. Meyer, assignor to Morgan & Wright—both of Detroit, Michigan. United States patent No. 1,344,645.)

INKING ROLLER FOR PRINTING PRESSES. The ingredients include, approximately, in weight, aluminum flake, two pounds; lime, one-half pound; sulphur, three and one-half pounds; magnesia, four pounds; rubber, 40 pounds, and a softening agent. (Lee La Tour and Alton F. Munnell, assignors of one-third to Warren Small, all of Omaha, Nebraska. United States patent No. 1,345,200.)

THE DOMINION OF CANADA.

PRODUCING RUBBER COMPOSITIONS AND VULCANIZING PRODUCTS. The process of forming a rubber compound which consists in adding to rubber a wet precipitate of barium sulphate, which precipitate has been formed in the presence of a colloidal gel, mixing the resultant precipitate with the rubber, drying the mix, and heating the mix with a vulcanizing agent to effect vulcanization.

The homogeneous vulcanized product formed by adding to rubber animal glue formed into a gel by water, mixing the gel with the rubber, driving off the water, and heating the resultant dry mix with a vulcanizing agent to effect vulcanization. (The Good-year Tire & Rubber Co., assignee of Robert Clifford Hartong, both of Akron, Ohio, U. S. A. Canadian patent No. 201,278.)

PLASTIC MATERIAL. A new substitute for horn, hard rubber, celluloid, etc., consisting essentially of albuminoids treated with formaldehyde and of the fine cell membranes of the emptied yeast cells. (Earnest Krause, Steglitz, and Hans Blucher, Leipzig, both in Germany. Canadian patent No. 201,420.)

THE UNITED KINGDOM.

ARTIFICIAL RUBBER TIRE FILLING. A typical composition for the purpose indicated consists of five parts of mineral oil, such as "Valvoline," to one part protochloride of sulphur. V. Villa, 34 rue Bayard, Toulouse, France. British patent No. 141,755.)

VULCANIZING INDIA RUBBER. In the vulcanization of rubber compounds by hot air, litharge or its derivatives is replaced by an organic or inorganic reducing agent to obtain a light-colored product. Suitable agents are hydro-quinone, pyragallol, tannins, paramidophenol, glycine, trioxymethylene, and other derivatives of formaldehyde, hydrosulphites, neutral sulphites. In general, the amount of reducing agent should not exceed ten per cent of the rubber. (A. Heilbronner, 74 Boulevard Malesherbes, Paris, France. British patent No. 142,083.)

COATING MATERIALS FOR FABRICS. The material known as Turkish birdlime produced from the fruits of *cordia myxa* and

cordia latifolia, is thinned and used for proofing balloon fabrics, gas helmets, etc. The balloon fabric is composed of two sheets of thin flexible material, one or both sheets being of absorbent material. One of the sheets has applied to its outer surface a coating of rubber or waterproof varnish, and to its inner surface a thin layer of birdlime. The other sheet has a coating of rubber, etc., on the surface next to the birdlime, the other surface being left bare. (C. A. Cleghorn, Brackenside, Woburn Sands, Bedfordshire, and Gayner Pneumatic Co., 95 Cannon street, London. British patent No. 142,160.)

A TIRE FILLING MOLDED IN CYLINDRICAL FORM AND USED TO replace the ordinary inflated inner tube is formed by adding sulphur chloride (six pounds, nine ounces) to a mixture of soya bean oil (25¼ pounds), magnesia (two pounds), and venetian red (five ounces). The oil is cooled before admixture, to 20-32 degrees F. to moderate the reaction. To insure uniform cooling the molds are provided with tubular metal cores which are withdrawn when the composition has set and the central space is filled with a fresh quantity of composition. (W. G. Wright, 1838 Collingwood street, Vancouver, B. C., Canada. British patent No. 142,416.)

PROCESS OF MAKING HEXAMETHYLENE TETRAMINE.

Commercial ammonium carbonate is dissolved in 40 per cent formaldehyde solution, the reaction taking place readily without application of heat and with brisk evolution of carbon dioxide. The solution is evaporated to dryness on a water bath under reduced pressure, and the residue is sublimed *in vacuo* or recrystallized from absolute alcohol. To compensate for its variable composition the amount of ammonium carbonate taken should be about 10 per cent in excess of the theoretical quantity. The yield of hexamethylene tetramine is about 66 per cent of the theoretical amount. (W. Herzog, "Zeitschrift Chemie," 1920, 33, 48.)

LABORATORY APPARATUS.

THE SCHAAR UNIVERSAL ELECTRIC HEATER.

THE ILLUSTRATION shows an all-purpose electric heater that can be used as a hot-plate or for heating flasks or test tubes. As a flask heater it displaces the usual tripod or support and burner. Test tubes are heated by placing them in the perforated cylinder which fits into the center of the heater between the coils.



ELECTRIC HEATER.

To transform the heater into a hot-plate the conical top is removed and replaced with a metal disc which fits over the opening.

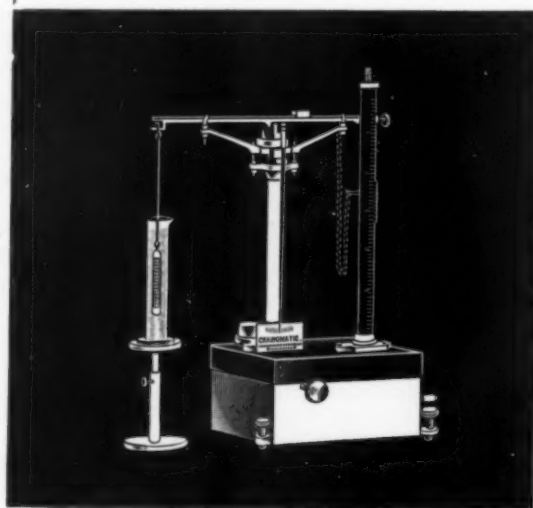
The heater is mounted on a solid base which can be screwed to the table. (Schaar & Co., 556 West Jackson Boulevard, Chicago, Illinois.)

SPECIFIC GRAVITY CHAINOMATIC BALANCE.

Reference to the illustration shows the general construction of this balance, advantage having been taken of the salient features of the analytical chainomatic balance, which has so revolutionized weighing in analytical chemistry. There are no loose weights to use, all weighings or determinations are accomplished by placing the sliding weight in the proper notch on the beam, and obtaining the final reading by adding weight to the beam by means of the chain.

The balance is furnished either with or without a case. In the former instance it has a sensitivity of one-tenth of a milligram. The instrument has an aluminum beam, agate bearings, glass base, spirit level, etc. The plummet displaces exactly two grams of distilled water at 15 degrees C. The enclosed ther-

mometer, carefully calibrated, ranges to 30 degrees C. The small displacement makes the balance invaluable where only

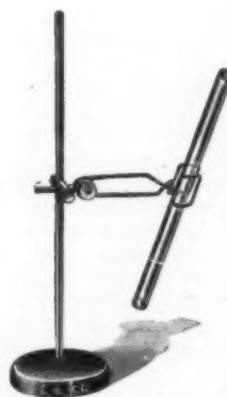


SPECIFIC GRAVITY BALANCE WITHOUT CASE.

small quantities of liquid are available. (Christian Becker, Incorporated, 92 Reade street, New York.)

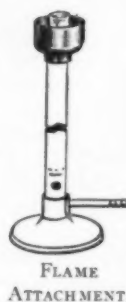
MONOCHROMATIC FLAME ATTACHMENT AND TUBE SUPPORT.

A new monochromatic flame attachment adaptable to any ordinary Bunsen burner is shown in the accompanying illustration. It consists of a simple cup arrangement permitting the solution of any salt to be used.



TUBE SUPPORT.

A very convenient and simple stand or support for tubes is here shown. It is compact, low priced and suitable for supporting tubes of any kind and in connection with holding apparatus in place. Both of these useful laboratory accessories are marketed by the same company. (Central Scientific Co., 460 East Ohio street, Chicago, Illinois.)



FLAME ATTACHMENT.

FINENESS AND TEXTURE OF PIGMENTS.

An unique method for testing the fineness and texture of pigments is given by H. A. Gardner in Circular No. 90 issued by the Paint Manufacturers' Association of the United States (Philadelphia).

The method of test consists in rubbing with the finger a portion of the pigment across the grooves of an Edison disk phonograph record and observing the surface under a microscope. There are 150 grooves per inch of radius on a disk record, and each groove has a radius of curvature of 0.004-inch and average depth of 0.001-inch. The feel of the pigment on the record under the finger, together with the microscopic examination, will show characteristic differences in the pigments. The number of particles per unit weight of pigment may be determined with a haemocytometer using a suspension of one gram of pigment in one liter of water containing a small amount of gelatin.

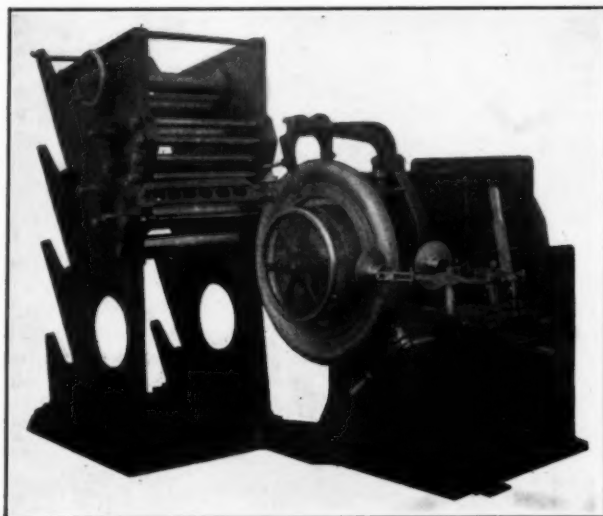
New Machines and Appliances.

IMPROVED TIRE BUILDING MACHINE.

THE improved tire-building machine here shown consists of two parts, a winding and stitching unit and a tension unit, both being doweled and bolted together forming a complete machine. It is used for the manufacture of fabric tires and for smaller sizes of cord tires. The capacity of the machine is 50 to 120 carcasses in a 10-hour day with one operator.

In operation, the roll of frictioned fabric is placed in the machine and the loose end threaded over the tension rollers and applied to the core. When this revolves it pulls the fabric over the tension rollers and lays it on the core. The speed of the core is controlled by gearing on the tension rollers so that the fabric cannot be applied to the core faster than the predetermined stretch in proportion to the gears and the tension rollers. Thus, the fabric will be stretched uniformly on all cores, regardless of width or variation of any kind, and can be measured to exact length and uniformly stretched, bringing the ends together.

When the machine has completed one revolution the fabric is cut off, the splice made, and the ply stitched down on the core. The next ply is put on in the same manner and when the proper number have been applied to the core, the bead is



THE BANNER TIRE BUILDER.

placed, and the remaining plies are added and stitched down separately. The tire is then trimmed and the carcass is finished.

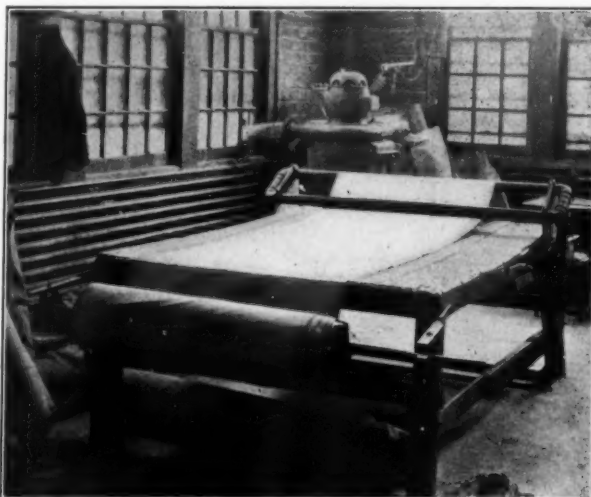
This machine is unique in that as soon as the fabric is cut off, all sides of the core are available for inspection or removal, and no part of the machine overhangs it, or interferes at the sides with the handling or manipulation of the core. (The Banner Machine Co., Columbiana, Ohio.)

TIRE FABRIC CLEANING MACHINE.

Vacuum cleaning has been used for some time in removing from factories dust and dirt of every character, but the direct application of air cleaning in rubber mills is comparatively recent. That the Tuec air-cleaning system is being successfully used in cleaning and renovating tire fabrics may be seen in the illustration.

This apparatus is used in connection with a stationary cleaner. The top of the fabric is cleaned in passing over the bottom tube,

and the bottom of the fabric is cleaned in passing over the top tube. The tubes are of brass and properly slotted, with adjustable cover to fit any size of fabric, up to and including 92 inches.



RENOVATING LINERS.

These tubes pass from 160 to 320 cubic feet of air per minute, thus the fabric is given an air bath, removing soapstone, lamp-black and other substances adhering to the fabric. (The United Electric Co., Canton, Ohio.)

VULCANIZER FOR FACTORY DAMAGED RUBBER GOODS.

Tire manufacturers can make firsts out of factory damaged casings by using the spot vulcanizer here shown. The clamp carries a steam plate $1\frac{1}{2}$ by 3 inches and is provided with a rocking table inside the casing making it self-adjusting to any uneven thickness. It is used in footwear and druggist sundries factories and also for repairing inner tubes.

To set up the vulcanizer, run two headers along the wall, one for steam, the other for condensation. One set of headers



THE SPOT VULCANIZER.

can be used for several units placed about two feet apart. A short length of chain with a hook on the end, attached to a piece of rope from the ceiling should be provided to hold the casing in the desired position. (G. S. Andrus, Akron, Ohio.)

THE LAFAYETTE PRECISION TOOL GRINDER.

While one of its most obvious applications is on a tool-room lathe for both internal and external thread-gage grinding, this machine is also intended as a grinding machine when used on the bench, and as a grinding attachment

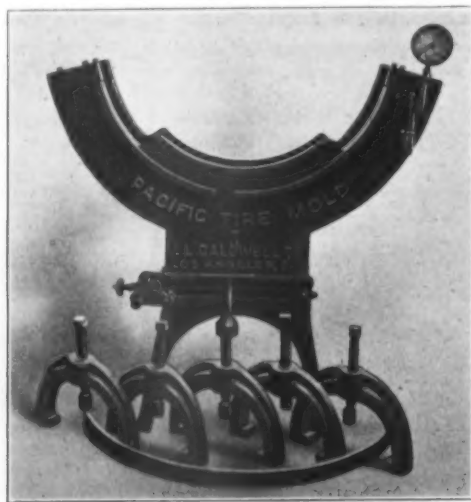


UNIVERSAL TOOL GRINDER.

to be applied to lathes, milling machines, shapers, planers, etc., to handle a variety of work. The grinding-wheel spindle-bearing housing has a longitudinal movement in a saddle, which in turn has a vertical movement on the column. A swivel is provided with a protractor of large radius for inclining the grinding-wheel spindle, when thread grinding, to suit the helix angle. Micrometer dials are provided for both longitudinal and vertical adjustments, making it very convenient to obtain accurate settings whenever required for precision work. This machine is designed and manufactured for grinding within 0.0001-inch, and all of its parts are interchangeable. (Lafayette Tool & Equipment Co., Lafayette, Indiana.)

RETREAD MOLD AND SECTIONAL VULCANIZER.

A compact, combination retread mold and sectional vulcanizer is being introduced on the Pacific Coast that can not only cure maximum size tires, including cord tires, in its one-third-circle



PACIFIC TIRE REPAIR MOLD.

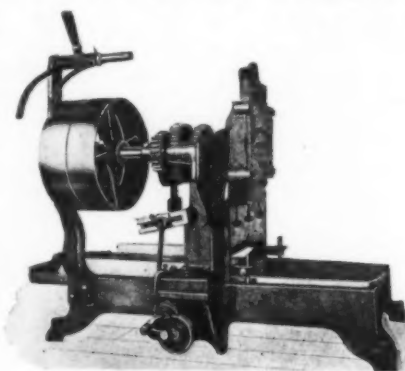
matrix, but with bead molds, which can be supplied, sections may be vulcanized in the same mold as readily as in the ordinary sectional vulcanizer. It has a self-contained boiler, full steam-jacketed walls, and raised steam-jacketed center section to take bead molds when using it as a sectional vulcanizer. Non-heat-conducting blocks on the ends of the mold prevent the stock from flowing, blistering, or leaving a burr on the ends of a cure. The rib tread is machined in the solid casting; and, it is claimed, the retreaded tire has the appearance of a new cord tire.

The complete unit includes five strong steel clamps, gas burner, steam gage, safety valve, overflow valve, filler, filler valve, spring steel pressure band, wrench, and mill hose sand bag. If desired, connections can be provided for steam plant line, or for gasoline or kerosene gas burners. (L. L. Caldwell Co., 1128 Van Nuys Building, Los Angeles, California.)

STOCK CUTTER FOR SMALL MOLDED GOODS.

Rubber manufacture requires so many different processes that machines in great variety are employed. The mechanical engineer in a modern rubber mill is keen on labor-saving machinery and does not hesitate to adopt a machine or appliance used in other trades.

A case in point is the power vertical caramel cutter shown in the accompanying illustration that will find ready use as a stock cutter for small molded goods. It will cut any width from

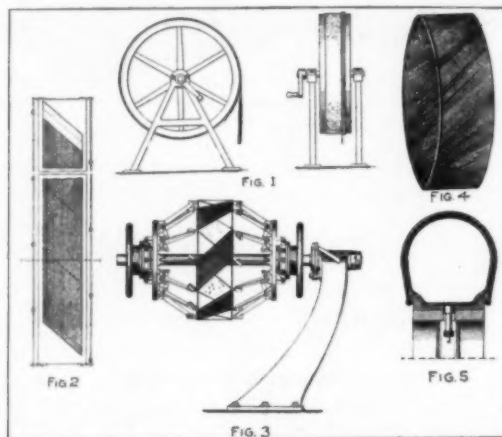


SHEET STOCK CUTTER.

1/16-inch to 2 inches, the platen being automatically moved forward by a ratchet-and-pawl feed. Squares of any size may be cut by turning the cut sheet of stock and again running it through the machine. Another type of machine employs a knife that operates with a shearing cut. (Thomas Mills & Bro., Inc., Philadelphia, Pennsylvania.)

MACHINERY PATENTS.**APPARATUS FOR MAKING CARLISLE CORD TIRES.**

A BAND of composite material consisting of a plurality of rubberized cords is first laid in parallel contact on a sheet of uncured rubber. The rubber sheet of the correct width and



CARLISLE CORD TIRE APPARATUS.

length is applied to the periphery of the drum shown in Fig. 1 and the cord spirally laid on the sheet by revolving the drum.

When the winding is completed the composite band is severed

by a bias cut and removed from the drum to the table shown in Fig. 2. Here the ends are trimmed and guide lines marked on the band at the desired angle and correct distance apart by means of a straight-edge and guide pins. The lines indicate the points where the band is to be alternately folded around the bead rings.

The band is then spirally wound upon and between two annular bead rings held in parallel position in the building stand shown in Fig. 3, the band being passed back and forth between, and over and around the rings with the exposed surface of the rubber sheet facing inwardly in the outer layer and outwardly in the inner layer. In the same way, a second band may be applied between the convolutions of the first band, and its interior surface covered by a sheet of rubber stock.

The completed carcass shown in Fig. 4 is then shaped on an air bag as seen in Fig. 5, or an ordinary core and finally completed and cured in the usual manner. (Fred B. Carlisle, Andover, Massachusetts, assignor to Joseph M. Gilbert, New York City. United States patent No. 1,345,995.) Patent No. 1,345,996, granted to the same inventor and assignee, relates to an improved band-marking apparatus, and patents Nos. 1,345,994 and 1,345,996-1,345,998, inclusive, refer to the process of manufacturing tire casings with this apparatus.

OTHER MACHINERY PATENTS.

THE UNITED STATES.

- N**O. 1,345,426. Attachment for rubber making mills. H. A. Welton, assignor to Morgan & Wright—both of Detroit, Mich.
- 1,345,995. Apparatus for making pneumatic tire casings. F. B. Carlisle, Andover, Mass., assignor to J. M. Gilbert, New York, N. Y.
- 1,345,996. Apparatus for use in the manufacture of pneumatic tire casings. F. B. Carlisle, Andover, Mass., assignor to J. M. Gilbert, New York, N. Y.
- 1,346,158. Continuous tire-vulcanizing machine. T. F. Baily and F. T. Cope, Alliance, O.
- 1,346,231. Tire core. T. Mideley, Sr., Columbus, and T. Mideley, Jr., Dayton—both in Ohio, assignors to The Fisk Rubber Co., Chicopee Falls, Mass.
- 1,346,232. Overflow cavity for molds. T. Mideley, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls—both in Mass.
- 1,346,483. Tire vulcanizer. G. B. Cooper, Cleveland, O.
- 1,346,615. Apparatus for coating fabrics. A. Thoma, Cambridge, assignor to Abraham Sydeman, Boston—both in Mass.
- 1,346,706. Machine for forming rolls on toy balloons. H. R. Gill, Ashland, O.
- 1,346,947. Clamp for repairing tires. W. R. Fontaine, assignor to Western Vulcanizer Manufacturing Co., a copartnership consisting of H. K. Wheelock, F. A. Weller, and W. B. Fontaine—both of Chicago, Ill.
- 1,347,213. Clamp for vulcanizing machines. O. T. De Long, Atlanta, Ga.
- 1,347,256. Coating apparatus. L. R. Davis, assignor to Revere Rubber Co.—both of Providence, R. I.
- 1,347,291. Testing machine. R. B. Price, New York, N. Y., assignor to Rubber Regenerating Company, Naugatuck, Conn.
- 1,347,650. Rubber cement mixing machine. C. C. Mosher, Lima, O.

THE UNITED KINGDOM.

- 142,634. Hydraulic press for shaping and vulcanizing tires. E. Lefebvre, 6 rue Carême-Prenaut Argenteuil, Seine-et-Oise, France.
- 142,642. Calender for stretching and finishing tubular fabrics. G. Hunt, 9 Elm Tree avenue, West Bridgford, and C. W. Campion, Robin Hood street—both in Nottingham.
- 142,871. Rubber-heel trimming machine. Miller Rubber Co., assignee of W. G. Lerch and C. P. Whisler—all of Akron, Ohio, U. S. A. (Not yet accepted.)
- 142,996. Machine for making pneumatic-tire covers. Dunlop Rubber Co., 14 Regent street, Westminster, and C. Macbeth, Para Mills, Aston Cross, Birmingham.
- 143,668. Segmental core for tires, to permit stretching from flat to U-section form before vulcanization. J. H. Nuttall and D. Bridge & Co., Castleton Ironworks, Castleton, Lancashire.

GERMANY.

PATENTS APPLIED FOR, WITH DATES OF APPLICATION.

- 71,287. (December 13, 1919.) Covered funnel for machine for cutting rubber rings. Karl Koehler, Hanover.
- 80,452. (November 5, 1915.) Appliance for the preparation of shoes for vulcanization. Boston Rubber Shoe Co., Malden, Mass., U. S. A.

DESIGN PATENTS ISSUED, WITH DATES OF ISSUE.

- 744,265. (May 31, 1920.) Vulcanizing apparatus. Peter Gruber, Frankfurt-on-Main.
- 744,870. (June 8, 1920.) Vulcanizing appliance. Henry Ewald Ba-t, Lawler, U. S. A.
- 745,896. (May 3, 1920.) Vulcanizing kettle. Peter Gruber, 68 Koelnerstrasse, Frankfurt-on-Main.
- 746,249. (November 3, 1919.) Stand for vulcanizing apparatus. Fleming & Cie., G. m. b. H., Charlottenburg.
- 746,285. (June 21, 1920.) Mold for manufacture of rubber soles and heels. Wilhelm Knop, 34 Franken Allee, Frankfurt-on-Main.

PROCESS PATENTS.

THE UNITED STATES.

- N**O. 1,345,944. Manufacture of pneumatic-tire casings. F. B. Carlisle, Andover, Mass., assignor to J. M. Gilbert, New York City.
- 1,346,389. Manufacture of cushion tires. F. W. Strang, assignor to Gibraltar Tire & Rubber Co., Dallas, Texas.
- 1,346,612. Manufacture of transmission disks for flexible couplings. R. J. Stokes, assignor to Thermoid Rubber Co., both of Trenton, N. J.
- 1,346,623. Manufacture of fabric tire casings. W. E. Williams, Chicago, Ill., assignor to the Firestone Tire & Rubber Co., Akron, O.
- 1,346,848. Manufacture of hollow rubber articles. F. T. Roberts, Cleveland Heights, O., assignor by mesne assignments to Paramount Rubber Consolidated, Inc., Philadelphia, Pa.
- 1,347,918. Manufacture of rubber and asbestos jointing material in long or continuous lengths. A. E. Stafford, assignor to Potter's Asbestos Co., Limited—both of Rochdale, Lancaster, England.

REISSUES.

- 14,875. Manufacture of vulcanized fabric belting cut on the bias. C. C. Gates, assignor by mesne assignments to The Gates Rubber Co.—both of Denver, Colo. (Original No. 1,281,153, dated October 8, 1918.)

THE DOMINION OF CANADA.

- 201,253. Manufacturing combined leather and rubber heels and attaching them to shoes. The United Shoe Machinery Co. of Canada, Limited, Maisonneuve, Que., assignee, of J. F. Standish, Massachusetts, U. S. A.
- 200,689. Manufacture of composite rubber and fabric top for cycle and like saddles by vulcanizing together two layers of rubber of different mixings separated by a layer of fabric. J. Jelley, Coventry, and H. Jelley, Birmingham—both in England.

THE UNITED KINGDOM.

- 142,257. Manufacture of tire casings, by W. L. Mitten, 125 Denison avenue, Davenport, Ia., U. S. A.
- 142,353. Attaching detachable heel-pads of rubber or other material. W. R. Vance, 54 Rushfield avenue, Belfast.
- 142,801. Manufacture of cloth-lined rubber shoes, etc. Y. Ose, Majima-cho, Shitaya-ku, Tokio, Japan. (Not yet accepted.)
- 143,445. Retreading tires. S. H. Goldberg, 1918 Prairie avenue, Chicago, Illinois, U. S. A.

THE FRENCH REPUBLIC.

- 504,142. Manufacture of seamless rubber goods. A. Boecler.

GERMANY.

PATENTS APPLIED FOR, WITH DATES OF APPLICATION.

- 32,189. (August 25, 1919. Italian patent, June 26, 1918.) Production of waterproof covering on hygroscopic material. M. Arosio.
- 49,583. (December 29, 1919.) Repairing pneumatic tires. E. Latel, 7 Beutzelstrasse, Dresden.

PATENTS ISSUED, WITH DATES OF ISSUE.

- 326,541. (October 10, 1918.) Vulcanizing rubber, reclaimed rubber, and similar products to metals. Felten and Guilleaume Carwerk Aktien-gesellschaft, Koeln-Mulheim.

REPAIRABLE AIR-BAG FOR TIRE REPAIR.

This tire repair air-bag consists of a metal frame and a cover made from two pieces of scrap inner tube covered with stockinette. It is said that this bag will eliminate the use of pads and last from forty to eighty cures. It can be quickly renewed in the following manner.



FRAME OF AIR-BAG.

Two pieces of tube are cut the length and size of the bag desired, and one tube is drawn inside the other. The tubes are placed over the frame that is held in a vise and the ends of the tubes tied to the ends of the frame with string. Two pieces of stockinette are applied over the tubes, the end cap placed over the stockinette and tubes, and the nut is tightened. The frame is then replaced in the vise at the tightened nut, the tubes and stockinette pulled over the other end of the frame, the cap applied and the nut tightened.



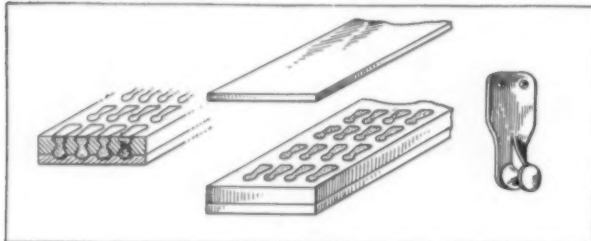
PERPETUAL AIR-BAG.

This bag is made in three, three and one-half, four and one-half, and five and one-half-inch sizes. The latter two take care of five and six-inch tires, respectively. (Perpetual Air Bag Company, 2103 South Michigan avenue, Chicago, Illinois.)

ARTISTIC MOLD WORK.

By Arthur C. Squires.

THERE ARE almost as many grades of mold work as there are states in the Union. Some work is coarse and without finish. Other is in color, texture, and finish, a product of great perfection. To this last-named class belongs the molded rubber grip used on hose supporters. Goods of this sort come under the gen-



GARTER BUTTON MOLD.

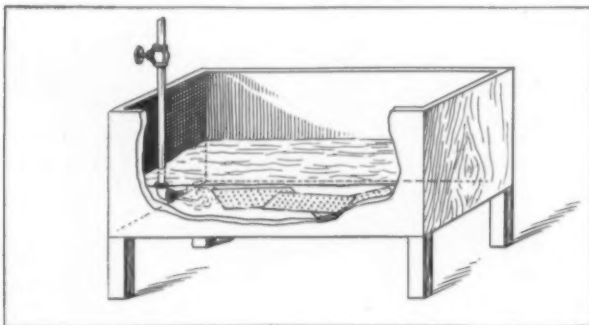
eral trade term "notions." As they are sold by the dry goods trade they must, of necessity, look at least as well as the dainty fabrics that are their counter mates. Of these goods some are wholly of rubber and some of both rubber and fabric. Where the goods are to present a fine appearance, and one side shows fabric, the molding involves considerable skill and processes not usually followed. The soft rubber garter grip is of this sort and merits especial description.

Beginning with the compound: this is of an extra whiteness secured by a formula of which lithopone is the base, a little ultramarine blue being added to get a blue-white. The compound is very rich, that the soft effect of pure rubber may be attained.

From the warming mills the snow-white compound goes to a three-roll calender which applies in two operations a continuous, thin coating of the stock to both sides of a web of unbleached sheeting. As the rubberized fabric finally leaves the calender it is wound up on a stock shell with a cotton liner between the gummed surfaces to prevent their sticking together.

The calendered stock is then cut into pieces conforming in width and length to the button mold, and placed in "books" for convenient handling.

The rubber button stock is of the same snow-white compound as that used for coating and sheeting, and is run through a tubing



BLEACHING TANK.

machine provided with a die conforming to the size of the button cavities in the mold. As this continuous cord is extruded from the tubing machine it is cut into small pieces of the proper size to fill exactly each mold cavity.

The 144-cavity steel button mold is originally made in three parts for convenience in die sinking, the two sections which form the rubber tab being riveted together while the third section or top plate is loose. After warming the mold slightly and dusting it with soapstone, pieces of the white button stock are inserted in

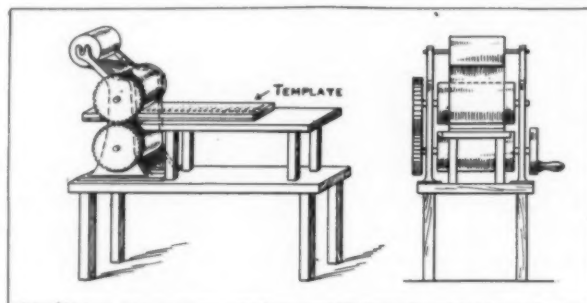
each cavity, and a full-sized sheet of the calendered sheeting stock is laid over the buttons to which it adheres. The top plate is then placed over the sheeting and the mold and its contents are ready for the cure that is effected in a vulcanizing press. After vulcanizing, the sheets containing the buttons are removed, the mold refilled, vulcanized and so on.

The next step is bleaching—that is accomplished in a wood tank containing water and chloride of lime, into which a live-steam pipe opens. The button sheets are placed in the tank and bleached by the boiling solution. After being dried by tumbling the sheets are ready for the stockinette that is to be applied to the back of the tab.

The snow-white stockinette is passed through the 3-roll calender, where it is coated on the unfinished side with a special white compound and wound up on a stock shell, no liner being required. The roll of stockinette is then placed in a slitting and rewinding machine that cuts the roll into strips, equal to the width of the button mold, and rewinds the strips on reels.

After the vulcanized button sheets have been coated on the back with a special cement they are ready to be "backed" with stockinette. This is done on a two-roll doubling machine that applies the stockinette to the backs of the button sheets, and cold cures at the same time. A wood or metal template is employed for holding the button sheet in place during this operation. A number of doubling templates can be used to good advantage.

The button sheet is now placed in the template with the buttons down, and a cold-curing solution brushed over the cemented sur-



STOCKINETTE-APPLYING MACHINE.

face of the sheet, after which the template is placed on the platen of the machine. The end of the coated stockinette strip being drawn down from the reel is passed around the pressure roller and alined with the end of the template to which it adheres.

When the machine is operated by turning the hand wheel the template passes under the pressure roller that doubles and applies a sheet of stockinette to the button sheet. The web is severed and another template placed in the machine, and the operation repeated.

The button sheets backed with stockinette are fully cured in about 30 minutes, after which the button tabs are died out with special cutting dies and sent to the finishing department, where they are assembled.

AMES HOLDEN MCCREADY, LIMITED, MONTREAL, QUEBEC, HAS promoted N. M. Lynn, formerly manager of its Edmonton branch, to middle western sales manager, with headquarters at its Winnipeg, Manitoba, office. He will have charge of sales in the provinces of Manitoba, Saskatchewan, and Alberta, with division offices and warehouses at Winnipeg, Regina, and Edmonton, and branch offices and warehouses at Saskatoon and Calgary. In addition to the lines of shoes, canvas, felt and rubber footwear already carried, all of these warehouses will be stock and distributing points for Ames Holden tires as soon as these are on the market in sufficient quantity.

New Goods and Specialties.

A CLEVER SPONGE RUBBER DOLL.

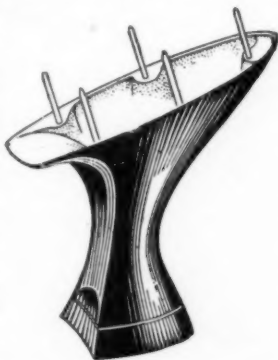
WHAT is perhaps the newest doll is cut from sponge rubber about an inch thick, reminding the grown-ups curiously of the gingerbread doll of younger days. Inside the sponge rubber hood is the head, made of an ordinary gray rubber ball, and on this ball the features are painted—blue eyes, saucy rose-bud mouth, yellow curl, and all. There are yellow buttons, too, painted on the "dress," and buckles on the "shoes." Incidentally, the head is sewed to the body with light-blue yarn, and more of the same yarn is tied around the neck and wrists. The yarn is also used for sewing in the circular piece of sponge rubber that forms the back of the hood. A later development of this doll shows a small square of the sponge rubber fastened to the top of the head, instead of the hood, while the space on the back of the ball is utilized for stamping the manufacturer's patent notice. (Rees-Davis Toy & Novelty Shop, 1716 Stevens Building, Chicago, Illinois, patent owner.)



SPONGE RUBBER DOLL.

FRENCH HEEL WITH RUBBER LIFT.

A new French heel is made of aluminum with a rubber lift attached. The rubber heel pad is attached to a metal plate by means of a screw in the center. This plate prevents the rubber heel from turning and draws it tightly to the aluminum heel proper to which it is fastened. This metal plate coming between the aluminum heel and the rubber one protects the rubber one from becoming worn by the aluminum. The illustrations show the entire heel ready for attachment to a boot and the rubber lift alone with the screw-hole in the center. This novel



ALUMINUM FRENCH HEEL WITH RUBBER PAD.

heel is patented by the manufacturer. (Automatic Aluminum Heel Co., 617 Albany street, Boston, Massachusetts.)

THE GLOVE WITH RUBBER GRIPS.

On page 365 of our March issue we described and illustrated a design for a glove with circular spots of ribbed rubber inside the hand and fingers, to facilitate the gripping of objects while the glove was being worn. A United States patent, No. 1,346,683, has now been granted on this glove. (J. N. Reynolds, Atlantic, Iowa.)

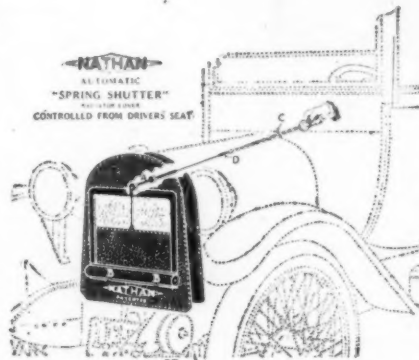
NEW BRITISH ARMY WATERPROOF.

A recent amendment to the dress regulations for officers in the British Army approves a new pattern of waterproof coat.

It is made of waterproof drab cotton twill, with two removable linings, one of fleece and one of oilskin. It is double-breasted, reaching to the knees, and has a buckled belt of the same material. Earlier patterns may be used by officers until worn out, but future provision must be of the new pattern.

RADIATOR COVER OPERATED FROM DRIVER'S SEAT.

A cover for automobile radiators that operates from the driver's seat is made of rubber-coated fabric rubberized to the lining, thus assuring the retaining of heat and resistance to the cold in winter. The particular style illustrated is the "automatic spring shutter," operated like a window shade from a roller which is detachably mounted on the radiator cover. This permits the easy removal of ice and adjustment of the spring by which the roller automatically winds up. (Nathan Novelty Manufacturing Co., 55 Fifth avenue, New York City.)



"NATHAN" AUTOMOBILE RADIATOR COVER.

PEARSON'S TOBACCO POUCH.

What is called the "Humidyzor" pouch for tobacco is made up in two styles of rubberized surface and several kinds of real leather, enabling the smoker to choose the style he likes best, according to the circumstances in which he will make most use of it.

In the rubberized styles, a specially dyed fabric and an ordinary bombazine are rubberized together and the bombazine side is given whatever coating finish is desired.

In the leather pouch, the same double fabric above described is used as a lining and sewed to the leather.

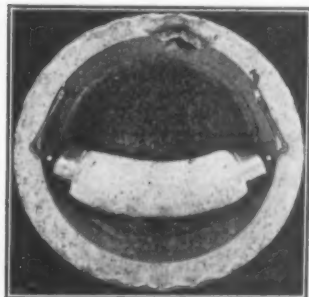
Accordingly, the pouch may be moistened inside without any water going through to the outside. This result has been obtained as the outcome of considerable expensive experimenting to produce such a double texture fabric, coated on the outer side, which would have the necessary water resistance on the outside and sufficient water absorption on the inside. The humidor feature of the pouch is patented and the pouch fastens with ball-and-socket snaps, as illustrated. (Pearson Products Corporation, 725 Broadway, south of 8th street, New York City.)



PEARSON'S "HUMIDYZOR" TOBACCO POUCH.

A WESTERN STEAM-CURING BAG.

A newly incorporated company in the Middle West is putting out a different style of steam-curing bag for vulcanizing tire repairs. It claims that the intense heat held in it cures at a uniform temperature the rubber both outside and inside, and has been in use for over three years. A larger size, to cure six, seven and eight-inch truck tires, has been perfected during the present year. This device is covered by basic patents in the United States and foreign countries, including Canada, Great Britain, France and Germany. (The Steam Bag Corporation, 1545-1547 Broadway, Denver, Colorado.)



THE "20TH CENTURY" STEAM-CURING BAG FOR TIRE REPAIRS.

THE FIRST CUBAN CORD TIRE.

That a representative of a Cuban tire manufacturer was in this country to investigate manufacturing processes and buy suitable machinery for the making of cord tires was noted in our news columns last month. The result is shown herewith—the first Cuban cord tire. (Compania Cubana de Zunchos y Goma—Cuban Tire & Rubber Co., Havana, Cuba.)



UNIVERSAL ADJUSTABLE DUST CAP.

DUST CAP FOR WIRE WHEELS.

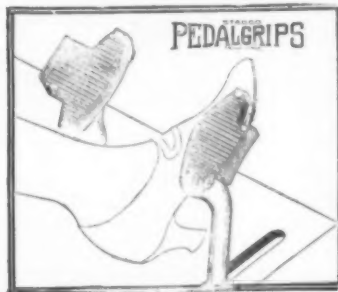
Harmonizing with the metal spokes of wire wheels, there has been designed a tire valve of nicked brass, which is also longer than the one ordinarily used on tires. This covers the entire length of the valve stem. Patent has been applied for. (A. Schrader's Son, Inc., 783 Atlantic avenue, Brooklyn, New York.)



FIRST CUBAN CORD TIRE.

"PEDALGRIPS" FOR FORDS.

The number of Ford automobiles in use offers an incentive to inventive genius to develop various accessories for use with this

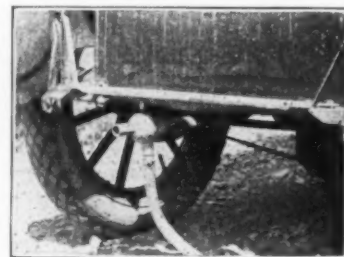


FORD "PEDALGRIPS."

make of car and in the accompanying illustration is shown a variation of what appears to be a special favorite in this field. A Ford car, as any driver of one knows, requires efficient pedal action, and rubber foot-pads are a definite help in securing this efficiency. "Pedalgrips" are made of high-grade rubber, with a ribbed, non-slip surface and make for sure-footedness, even for women who insist on wearing high-heeled footwear when driving. These pedal pads are furnished for both transmission and brake pedals and are applied without either bolts or screws. (Stadeler Metal Specialty Co., 310 South Canal street, Chicago, Illinois.)

A DETACHABLE VACUUM CLEANER.

A convenience for cleaning the upholstery of the automobile, motorists' clothing, etc., is pictured here, which attaches to the exhaust pipe of an automobile. To it is fastened a rubber hose and to the hose an open nozzle for cleaning floor mats, heavy dirt, etc., or a brush for cleaning upholstery and clothing. The exhaust from the engine when running operates this device, which is extremely simple. (Franklin Automobile Co., Syracuse, New York.)



LA FRANCE DETACHABLE VACUUM CLEANER.

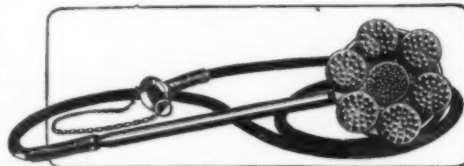
A NEW SPORT SHOE.

A new sport shoe is an oxford of white buckskin, with tan or black trimmings, and a heavy, corrugated, non-skid sole of rubber. It is designed especially for golf or general sport wear. (Norman & Bennett, Inc., 144 High street, Boston, Massachusetts.)

THE "STAR" MESSAGE SPRAY.

A new development of the shower bath spray is shown here.

One of the features that is patented is that the water sprays through holes in the metal container, back of the applicator, instead of from the rubber prongs as in some other designs. There are six round groups of these rubber prongs arranged in a circle on the outside of the metal container, while in the center is a round piece of sponge rubber which serves as a sponge. The applicators are removable, which contributes to the sanitary qualities of this latest spray. (The Fitzgerald Manufacturing Co., Torrington, Connecticut.)



THE NEW "STAR" MESSAGE SHOWER SPRAY.

THE NEWCOMER IN CORD TIRES.

One of the newest cord tires has a rectangular tread that offers resistance in a straight line to both the side and forward skid. At the same time, it affords complete steering ease because of its continuous, unbroken road surface. The Kenyon Cord is made full oversize, with black tread and gray side walls.

It is interesting to know that the manufacturer turned to cord tires as the solution of the after-the-war problem of what to do with the big factory that made waterproof clothing for the soldiers, as well as rubberized life-saving suits and weather-proof and water-proof clothing for civilian wear, for both men and women. (C. Kenyon Co., 754 Pacific street, Brooklyn, New York.)



KENYON CORD TIRE.

Activities of The Rubber Association of America.

THERE was very little activity in Association affairs during the past month other than the usual routine matters. Division meetings were deferred until after the vacation period, and for that reason there is nothing to report at this time.

RUBBER STATISTICS FOR FIRST HALF OF 1919.

NEW YORK, August 6, 1920.

To firm members:

There are enclosed two copies of the statement embodying a summary of the returns made by rubber manufacturers and reclaimers to Questionnaire No. 101, covering the first six months of 1919.

The information presented represents totals for the number of manufacturers and reclaimers reporting the data for their companies and is submitted as an entirety without any attempt to make an estimate as to the approximate totals for all firms to whom the questionnaire was sent.

In this connection, we are much gratified to be able to direct attention to the fact that the response to Questionnaire No. 101, while slower than we hope it will be in the future, is finally considerably more complete than was the response to the previous Questionnaire, No. 100, the exact figures being 153 returns to Questionnaire No. 101 vs. 103 to Questionnaire No. 100, both out of a total of approximately 270 firms to whom each questionnaire was sent.

A new questionnaire, No. 102, covering the latter half of the year 1919 is being sent you at this time, and we wish to take this opportunity of urging that the response to this questionnaire be as prompt and complete as is possible, in order that information for the entire year may be available in the very near future.

A. L. VILES, General Manager.

THE RUBBER ASSOCIATION OF AMERICA, INC., STATISTICS COMPILED FROM QUESTIONNAIRE NO. 101, COVERING THE FIRST SIX MONTHS OF 1919.

This questionnaire was sent to 273 firms of which 163 responded and 153 reported statistics.

AVERAGE TOTAL DAILY NUMBER OF EMPLOYEES, 166,103.

	Reported by Manufacturers who also Reclaim (18).	Reported by Reclaimers Solely (10).	Totals.	Approximate Amount Scrap Used per Pound of Reclaimed Produced.
Reclaimed rubber produced from raw and cured scrap...pounds	25,861,345	57,515,312	83,376,657	1 lb., 5 oz.
Scrap rubber (including raw and cured scrap) consumed in production of reclaimed rubber .....pounds	31,928,556	80,922,149	112,850,705	

NUMBER OF POUNDS OF CRUDE RUBBER CONSUMED IN THE MANUFACTURE OF RUBBER PRODUCTS AND TOTAL SALES VALUE OF SHIPMENTS OF MANUFACTURED RUBBER PRODUCTS.

Product.	Number of Pounds Crude Rubber Consumed.	Total Sales Value of Shipments of Manufactured Rubber Products.
Tires and tire sundries:		
Automobile and motor truck casings.....	103,926,192	\$94,329,257
Automobile and motor truck tubes	22,272,497	27,246,850
Solid tires	11,686,767	7,889,941
Other tires and tire sundries	6,523,726	6,466,243
*Total—tires and tire sundries	145,538,745	\$307,403,497
Other rubber products:		
Mechanical prod....	10,053,317	\$45,042,163
Boots and shoes.....	14,301,480	46,617,582
Other products	6,695,533	27,888,645
*Total—other rubber products	31,159,003	\$127,756,611
Grand total—all products.	176,697,748	\$435,160,108

*NOTE.—It should be noted that the above totals of "Tires and tire sundries" and "Other rubber products" include some figures which are not shown under the various items, which is due to the fact that some of the reports received were not itemized.

QUESTIONNAIRE NO. 102.

NEW YORK, August 6, 1920.

To rubber manufacturers:

Questionnaire No. 102, in duplicate, is enclosed with the urgent request that it be given attention and the data called for therein be supplied to this office at the earliest opportunity. The information desired is that covering the second six months of 1919, to supplement the information compiled from Questionnaire No. 101, which covered the first six months of 1919, the results of that questionnaire being distributed concurrently with this.

We have frequently directed attention to the desirability of there being available accurate and comprehensive statistics covering the industry, and in view of present general conditions we believe that the value of data of this character and of the more detailed sort to which we hope this statistical work may be extended during the coming year, will be obvious to everyone.

We wish to emphasize again the fact that there is no cause for hesitancy upon the part of any member in supplying the data called for by this questionnaire, because under the arrangement with the Guaranty Trust Company, by which the work of compilation is done, none but the total figures are available to any member of the Association or its staff and there is no likelihood of the data for an individual member becoming known to others.

The questionnaire covering the first six months of 1920 will follow this in a few days, and we wish to suggest that at this time the compilation of data is especially important and we hope, therefore, that each of our members will find it possible to give the necessary attention to the preparation and transmittal of information which will enable the total figures to be distributed within the next six weeks.

A. L. VILES, General Manager.

NEW TRADE PUBLICATIONS.

THE APSLEY RUBBER CO., HUDSON, MASSACHUSETTS, HAS ISSUED its new price-lists of canvas footwear, including both its regular lines of tennis and its Ap-Sole line of summer footwear. The lists are dated August 2, 1920, and are subject to change without notice.

THE CARTOON IN ADVERTISING IS PROVING A VERY EFFECTIVE MEDIUM of pleasant publicity. Rubber and other firms have used cartoons extensively in printed advertising, but it remained for The B. F. Goodrich Rubber Co., Akron, Ohio; to apply the idea to motion pictures. These amusing cartoon episodes of Goodrich tires put the audience in an uproar, and the next instant the dealer's name and address flashes on the screen. It is the kind of advertising that brings comment as well as results.

THE BOSTON BELTING CO., 80 ELMWOOD STREET, BOSTON, MASSACHUSETTS, has issued a good-looking booklet in two colors, describing and giving prices of rubber and balata belting, hose, matting and mats, packing and molded goods. The cover design is especially interesting as it is a reproduction of an original print that was designed prior to the Civil War.

"THE JOURNAL OF THE ROYAL SOCIETY OF ARTS" (LONDON, ENGLAND), issues of February 20th and 27th, 1920, contain a very interesting paper by Sir Francis Watts, K. C. M. G., D. Sc., Imperial Commissioner of Agriculture for the British West Indies, entitled "Tropical Departments of Agriculture With Special Reference to the West Indies," which was read at a meeting of the Colonial Section of the Society held on February 3, 1920.

MARTINUS NIJHOFF, BOOKSELLER AT THE HAGUE, HOLLAND, celebrates the 300th anniversary of the settlement of Batavia by issuing a catalog of publications on the Dutch East Indies, No. 454, "Histoire Naturelle, Cultures, Médecine et Anthropologie des Indes Orientales Néerlandaises." This includes 44 publications on rubber and gutta percha. The same house has issued recently catalogs on the Dutch in the Orient before and after 1800. It also

announces the new edition of the "Encyclopaedie van Nederlandsch-Indië" in four volumes.

THE YARNALL-WARING CO., PHILADELPHIA, PENNSYLVANIA, has just issued a well illustrated and highly informative 16-page bulletin, free on request, descriptive of Yarway blow-off valves, that will be read with particular interest in certain states where boiler laws require the use of either two valves or a blow-off valve and a cock on each individual blow-off line.

THE EDITOR'S BOOK TABLE.

"THE ORGANIZATION OF INDUSTRIAL SCIENTIFIC RESEARCH." By C. E. Kenneth Mees, D.Sc., Director of the Research Laboratory, Eastman Kodak Co., Rochester, New York. First Edition. McGraw-Hill Book Co., Inc., New York and London, 1920. (Cloth, 175 pages, 5½ by 8¼ inches.)

IN HIS PREFACE the author states that this book is intended as a contribution to the study of the best methods for organizing industrial research work and of the conditions under which such work should be conducted.

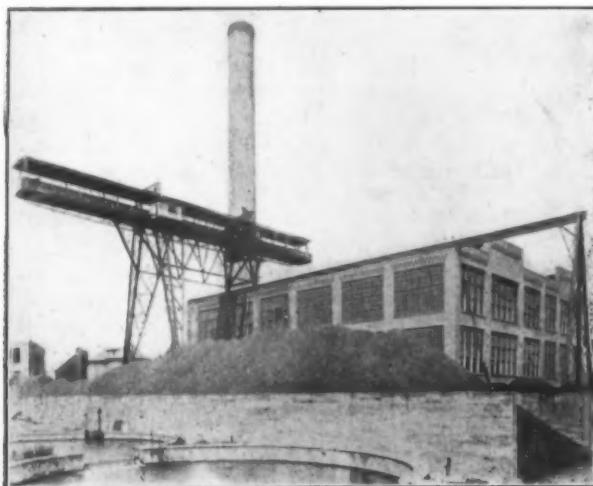
The author discusses the various types of research laboratories; their position in an industrial organization; their internal organization; the staff, building and direction of the work; and a chapter on the design of a research laboratory for a special industry in which costs of operation are dealt with. The book closes with a classified bibliography on the subject of research laboratories and an index of authors and of laboratories, which will doubtless be found of much assistance.

"A GERMAN-ENGLISH DICTIONARY FOR CHEMISTS." BY Austin M. Patterson, Ph.D. First Edition, John Wiley & Sons, Inc., New York. Chapman & Hall, Limited, London, 1917. (Flexible leather. 316 pages, 5 by 7 inches.)

English-speaking chemists generally will be grateful to Doctor Austin for valuable aid to them as available in this most convenient work. Particularly helpful features are the excellent introduction and the use of Roman in place of German text.

COAL HANDLING CRANE FOR RUBBER MILLS.

The coal-handling crane at the plant of the Firestone Tire & Rubber Co., Akron, Ohio, is of a semi-gantry type, one leg running on the ground and the other running along the roof of the building. The crane is equipped with a traveling man-trolley. All of the operations of the crane are con-



HANDLING COAL AT THE FIRESTONE PLANT.

trolled from the operator's cab attached to this man-trolley. In connection with this equipment a traveling coal crusher is also furnished. This crusher travels along the top of the building directly over the hopper leading to the stoker sys-

tem. The crane handles coal from car to storage and from storage to the traveling coal crusher where it is crushed and discharged into stocker. Coal may also be handled direct from cars to crushers, if desired. The crane is electrically operated, alternating current being used. The man-trolley is equipped with two drums which are operated by friction clutches and brakes, this arrangement contributing to maximum speed of operation. A two-cubic-yard bucket of the four-line type is used. (McMyler-Interstate Co., Cleveland, Ohio.)

A ROTARY SPRINKLER OF VARYING RADIUS.

A new type of lawn or garden sprinkler which fits any hose connection has been developed, illustrated herewith. It is operated by means of the pressure of the water required for sprinkling, and will spray an area ranging from 15 to 80 feet in diameter. There is a wheel with blades like a propeller, which cuts the water into drops as it revolves, while the sprinkler head rotates in a circle. The area sprinkled is regulated by turning down the faucet. The gears are enclosed, running in an oil bath, and there are no separate parts to get out of order. The machine is finished in gold bronze and carries the manufacturer's guaranty for one year of satisfactory service, or price will be refunded. (Double Rotary Sprinkler Co., Coca Cola Building, Kansas City, Missouri.)



DOUBLE ROTARY SPRINKLER.

A "MERMAID" BRUSH.

In the INDIA RUBBER WORLD of January 1, 1919, there was illustrated and described the "Maid-of-America" hair brush, with removable rubber cushion in which the bristles were vulcanized. The manufacturer

is now putting out a similar brush called the "Mermaid," which operates in the same way. (Monarch Brush Co., Troy, New York.)

INTERESTING LETTERS FROM OUR READERS.

TREUGOLNIK NOT RUN BY GERMAN CAPITAL.

TO THE EDITOR:

DEAR SIR: On behalf of my principals, the Russian American India Rubber Co. "Treügolnik" of Petrograd, I wish to take exception to a statement namely: "The 'Treügolnik' company, before the war, was mainly run by German capital," which appeared in the last paragraph of an article written on page 533 of the May 1, 1920, issue of THE INDIA RUBBER WORLD, as the statement is not only without any foundation, whatsoever, but, appearing in your journal, it is likely to have a detrimental effect on the interests of the "Treügolnik" company.

From the fact that the article in question was written entirely in the interests of the "Treügolnik" company's largest competitor, it is possible that such incorrect information was given you for a definite purpose.

I sincerely trust that you will see your way clear to publish a contradiction in one of your next issues.

STINTON J. JONES,

For The Russian American India Rubber Co.

London, England.

News of the American Rubber Industry.

DIVIDENDS.

THE AJAX RUBBER Co., Inc., has declared its quarterly dividend of \$1.50 per share, payable September 15 on common stock of record August 31, 1920.

The American Chic Co., New York City, has declared its regular quarterly dividend of one and one-half per cent, payable October 1 on both preferred and common stock of record September 18, 1920.

The Bergougnan Rubber Corporation, Trenton, New Jersey, declared a dividend of one and three-quarters per cent, payable August 10 on preferred stock of record July 10, 1920.

The Brunswick-Balke-Collender Co., Chicago, Illinois, has declared a stock dividend of 150 per cent, on common stock, payable in new class B stock, in addition to the regular quarterly dividend of one and three-quarters per cent, which was payable August 15 on common stock of record August 5, 1920.

The Firestone Tire & Rubber Co., Akron, Ohio, declared a quarterly dividend of one and three-quarters per cent, payable August 15 on its seven per cent preferred stock of record July 31, 1920.

The General Electric Co., Schenectady, New York, has declared its quarterly dividend of \$2 per share, payable October 15, on common stock of record September 9, 1920.

The B. F. Goodrich Co., Akron, Ohio, and New York City, has declared dividends of \$1.75 and \$1.50 per share, the first payable October 1 on preferred stock of record September 21, and the second payable November 15 on common stock of record November 5, 1920.

The Goodyear Tire & Rubber Co., Akron, Ohio, has declared its quarterly dividend of two and one-half per cent, payable September 1 on common stock of record August 14, 1920.

The Lee Rubber & Tire Corporation, Conshohocken, Pennsylvania, and New York City, has declared its quarterly dividend of 50 cents per share, payable September 1 on stock of record August 14, 1920.

The Miller Rubber Co., Akron, Ohio, has declared a quarterly dividend of two per cent, payable October 1 on its new preferred stock of record September 10, 1920.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, at a meeting of the board of directors held on August 20, declared its regular quarterly dividends of one and three-quarters per cent on preferred stock and one and one-half per cent on common, both payable September 30 on stock of record September 15, 1920.

The Rubber Products Co., Barberton, Ohio, has declared its regular quarterly dividend of two per cent, payable September 1 on stock of record August 20, 1920.

The Tyer Rubber Co., Andover, Massachusetts, paid the regular quarterly dividend of \$1.50 per share on preferred stock August 15, 1920.

FINANCIAL NOTES.

Sales of The Mason Tire & Rubber Co., Kent, Ohio, for the third quarter ended July 31, 1920, were \$1,748,000, compared with \$1,011,000 for the corresponding quarter of 1919, or an increase of over 75 per cent. Sales for the first nine months of the present fiscal year amounted to \$5,200,000, compared with \$2,550,000 for the corresponding period of last year, or an increase of more than 100 per cent.

The sales of The Goodyear Tire & Rubber Co., Akron, Ohio, for the first nine months of 1920 amounted to \$162,202,467.21,

according to official announcements. The company's sales for the whole of 1919 amounted to approximately \$168,914,000. The gross sales of the company during July of the present year amounted to \$17,185,113, as compared with \$15,989,349 during the same month last year. It is estimated that the gross sales of the company will approximate \$200,000,000 this year.

As a result of the new preferred and common stock financing and of its liquidating policy the Goodyear company is reducing its loans at the banks and expects by the end of its fiscal year to have its outstanding floating debt down to modest proportions.

The Brunswick-Balke-Collender Co. reports sales for the six months ended June 30, 1920, of \$15,243,178, a gain of \$5,181,803. Net profits after all taxes amounted to \$2,309,826. Gross sales for the first half of this year were at a record rate, showing an increase of 50 per cent. Stock dividends will be paid from the new stock authorized last April. In the meantime the company sold \$3,000,000 common stock to its stockholders at par, increasing the amount actually outstanding to \$9,000,000.

The Ajax Rubber Co., Inc., report net earnings of \$1,528,634 for the six months ended June 30, 1920, equivalent to \$7.64 a share earned on the 200,000 shares of stock (\$50 par value). This compares with \$1,886,730 or \$9.43 a share in the corresponding period of 1919. Gross sales were greater in volume in the first half of this year than in any similar period of the company's history, exceeding the first six months of 1919 by about 16 per cent net. The income account for the six months ended June 30, 1920, compares as follows:

	1920	1919	1918	1917
Net earnings.....	\$1,528,634	\$1,886,730	\$1,959,608	\$1,257,461
Dividends	600,000	488,528	426,000	390,000
Surplus	\$928,634	\$1,398,202	\$1,533,608	\$867,461
*After providing \$157,871 for taxes.				

Net sales of the United States Rubber Co., for the six months from January 1 to June 30, 1920, were \$129,588,986, an increase of \$30,099,615 over the corresponding period of 1919; and the net income, after deducting all interest charges and after allowing for depreciation and Federal taxes, was \$13,690,924, an increase of \$3,059,490 over the corresponding period of 1919.

The balance sheet of The B. F. Goodrich Co., as of June 30, 1920, shows as follows:

Assets: current assets, consisting of cash, bills and accounts receivable, and inventories of raw and finished stock, \$104,470,421; investments and advances to other companies, \$5,793,220, foreign associated companies, etc., \$8,802,624; deferred charges, \$1,231,813; real estate, plant, buildings and equipment, less reserves of \$9,456,892, \$27,762,228; patents and contracts, \$1; goodwill \$1; total, \$148,060,308.

Liabilities: current liabilities, \$31,902,556; 5-year 7 per cent convertible gold notes due April 1, 1925, \$30,000,000; reserves for contingencies, pensions and amortization of war facilities, \$3,759,879; preferred capital stock, \$38,412,000 (par \$100); common (no par) represented by accumulated surplus, \$43,985,873; total, \$148,060,308.

The company's net profits were \$7,600,000 before Federal taxes for the six months ended June 30, 1920, representing a decline of \$100,000 from net profits of \$7,700,000 for the corresponding period last year. At first glance this would seem to substantiate recent rumors that tire companies were doing less business. In the case of Goodrich, however, sales for the first half of this year were approximately \$20,000,000 greater than in the first six months of 1919 and the reason why profits did not show a corresponding increase is attributed to substantial increases in the costs of raw materials. The advance of from 10 per cent to 20 per cent in

the retail prices of its products put into effect last March, coupled with the fact that raw materials, especially rubber, are becoming somewhat cheaper, should result in an increased ratio of profit on sales during the balance of this year.

On estimated sales of \$90,000,000 in the first half of this year net profits, after preferred dividends but before Federal taxes, were at the annual rate of \$21.60 a share on 600,000 shares of no par value common stock. This compares with \$25.09 a share earned in 1919, the best year in the company's history.

In order to provide for expansion the International India Rubber Corporation, of South Bend, Indiana, which was incorporated for \$1,000,000 under the laws of Delaware in 1915, on February 7, 1920, increased the capital stock to \$2,500,000, by the addition of 60,000 shares, second issue, non-voting common stock of the par value of \$25 per share. The sales earnings in 1917 were \$107,333.52; in 1918, \$155,646.81; and in 1919, \$673,069.35. Up to March 1, 1920, sales were running more than 300 per cent of those for the same period of 1919 and the sales for 1920 are estimated at \$3,000,000.

RUBBER STOCK QUOTATIONS.

The following quotations on the Cleveland Stock Exchange, August 19, of stock of the principal rubber companies were supplied by Otis & Co., Cuyahoga Building, Cleveland, Ohio.

	Last Sale.	Bid.	Asked.
Firestone T. & R. Co.	117	114½	117
Firestone T. & R. Co., 1st pfd.	93	93	96
Firestone T. & R. Co., 2d pfd.	85	85	85½
General T. & R. Co., pfd.	102	102	102½
The B. F. Goodrich Co.	52¼	52	52½
The B. F. Goodrich Co., pfd.	85	85	85½
The Goodyear T. & R. Co.	115	110	114½
The Goodyear T. & R. Co., 1st pfd.	85	84½	85½
Kelly-Springfield T. & R. Co.	136¼	136	137
Portage Rubber Co., pfd.	120	119	121
The Miller Rubber Co.	119	115	120
Portage Rubber Co.	59½	59	60
Star Rubber Co.	350¼	350	351
Swinehart T. & R. Co.	80	80	81
Victor Rubber Co.	29	29	29

NEW YORK STOCK EXCHANGE QUOTATIONS.

August 23, 1920.

	Last Sale.	Bid.	Asked.
Ajax Rubber Co., Inc.	49½	49	50
The Fisk Rubber Co.	26¾	26½	27
The B. F. Goodrich Co.	54½	54	55
Kelly-Springfield Tire Co.	76	75	77
Keystone T. & R. Co., Inc.	18	18	18½
Lee R. & T. Corp.	21	21	22
United States Rubber Co.	84½	84	85

NEW INCORPORATIONS.

Bedell Inc., S. M., August 7 (New York), \$5,000. R. A. Wicksel; C. Schwartz; J. E. Ankus—all of 15 East 40th street, New York City. To manufacture tires.

Canton-Blackstone Sales Corp., The, July 28 (New York), \$60,000. A. E. Beckert, 530 West End avenue, New York City; A. J. Ewald, 36 Prospect street, White Plains—both in New York; P. A. Proal, Red Bank, New Jersey. To manufacture tires and rubber goods.

Central Rubber Reclaiming Co., The, August 1 (Ohio), \$175,000. J. F. Schaefer, president; C. E. Hart, vice-president; D. E. Reynolds, secretary and treasurer. Principal office, Defiance, Ohio. To reclaim rubber.

Collapsible Rim Co., The, June 17 (North Carolina), \$300,000. W. W. Bruce; J. J. Nicholas; F. L. Sale—all of Asheville, North Carolina. Principal office, Asheville, North Carolina. To manufacture and sell rims for automobile wheels.

County Seat Tire Co., Inc., August 19 (New York), \$2,000. F. Brush, 320 South Fifth avenue; C. Rosenbergs, 550 South Eighth avenue, both of Mount Vernon; D. Lisnow, 135 Broadway, New York City—both in New York. To repair tires.

F. & W. Tire Distributing Co., Inc., August 4 (New York), \$100,000. A. D. Ferrell; L. P. Werlein; T. E. Terry—all of Buffalo, New York. Principal office, Buffalo, New York. To distribute tires.

French & Handy, July 30 (New York), \$25,000. P. J. Ross; J. Q. Perry; H. W. French—all of 25 Beaver street, New York City. To deal in crude rubber.

Gordon Co., Inc., The, H. B., July 23 (Massachusetts), \$10,000. Bernard C. Harris B. and T. Gordon—all of South Pleasant street, Sharon, Massachusetts. Principal office, Boston, Massachusetts. To manufacture and deal in all kinds of rubber clothing.

Granville Tire Co., July 12 (New Jersey), \$15,000,000. F. D. Buck; G. W. Dillman; M. L. Harty—all of Wilmington, Delaware. Principal office, 305 Ocean avenue, Jersey City, New Jersey. Agent in charge, W. George. To sell automobile tires.

Grasso Tube Marine Life Saver Corp., August 13 (New York), \$250,000. J. H. Fitch; V. Guarino; L. Grasso—all of 106 East 119th street, New York City. To manufacture life belts and life-saving devices.

Guaranteed Tire Filler Corp., July 27 (New York), \$50,000. J. and M. Stander; A. M. Chamow—all of 1,092 President street, Brooklyn, New York. Principal office, Brooklyn, New York.

Handy Rubber Heel Co., August 9 (Massachusetts), \$100,000. W. Gamache, 31 Echo avenue, Beverly; W. Blancy, 1 Pearl street, Marblehead; J. J. McCarthy, 81 Washington street, Salem—all in Massachusetts. Principal office, Salem, Massachusetts. To manufacture rubber heels.

Hope Tire & Rubber Co., The, May 21 (Connecticut), \$20,000. B. Yarus, president and treasurer; S. Colitz, vice-president; M. H. Plainfield, secretary and general manager. Principal office, 140-142 Greyrock Place, Stamford, Connecticut. To rebuild tires.

Hopewell Insulation & Manufacturing Co., March 20 (Virginia), 7 per cent preferred, \$200,000; \$500,000 common. S. S. Sonneborn, president and general manager; E. A. Spengeman, vice-president; C. Branda, secretary. Principal office, Hopewell, Virginia. To manufacture hard rubber, composition rubber and all kinds of insulation products.

Hudson Tire & Rubber Corp., April 19 (New York), \$1,000,000. W. M. Doucette, president; H. B. Seymour, vice-president and treasurer; U. Wiesendanger, secretary. Principal office, 503 Proctor Building, Yonkers, New York. To manufacture and sell cord and fabric tires, etc.

International Tires Stores Corp., August 11 (Delaware), \$50,000,000. T. L. Croteau; M. A. Bruce; A. M. Hooven—all of Wilmington, Delaware. To buy, sell, and generally deal in rubber tires, tubes and accessories.

Pittsburgh Rubber Sundries Manufacturing Co., July 21 (Delaware), \$500,000. C. M. Blaskie; M. A. Bruce; S. E. Dill—all of Wilmington, Delaware. To manufacture and sell rubber and rubber products.

Pneumatic Rubber Heel, Inc., August 23 (New York), \$100,000. A. Allenberg, 3 East 44th street, New York City; G. Loock, 23 18th street, Astoria, both in New York; A. Seiferth, Hasbrouck Heights, New Jersey. To manufacture rubber heels.

Quality Tire Co., July 30 (New Jersey), \$50,000. J. J. Cooley, 34 Westfield avenue, Elizabeth; E. Feenack, 59 Sanhican Drive, Trenton; L. M. Ettinger, 459 High street, Newark—all in New Jersey. Principal office, 238 Halsey street, Newark, New Jersey. Agent in charge, F. J. Pfaff. To deal in automobile tires; distributor of Hood tires and tubes.

Rock Bestos Products Co., July 26 (Delaware), \$5,000,000. C. H. Blaskie; M. A. Bruce; F. E. Dill—all of Wilmington, Delaware. Asbestos products.

Sabbag's Rotary Rubber Heel Co., August 3 (Massachusetts), \$50,000. L. G. Sabbag, 810 Saratoga street; N. G. Sabbag, 863 Saratoga street, both of East Boston; H. A. Kenny, 42 Moreland street, Roxbury—both in Massachusetts. Principal office, Boston, Massachusetts. To manufacture and deal in rubber and leather heels, etc.

Seattle Asbestos Factory, April 28 (Washington), \$20,000. W. H. M. C. and John D. Chambers. Principal office, Seattle, Washington. To manufacture asbestos products.

Seabee Tire & Rubber Co., August 6 (Delaware), \$10,000,000. V. P. and M. M. Lucey; M. A. Davis—all of Wilmington, Delaware. To manufacture and deal in rubber tires, tubes, stems, valves, shoes, etc.

Stable Flex-Hub Wheel Co., July 21 (Massachusetts), \$100,000. W. K. Beardsley, 9 Stratford street; J. F. Moloney, 41 Peterborough street, both of Boston; P. J. Fitzpatrick, 96 Reservoir avenue, Revere—both in Massachusetts. Principal office, Boston, Massachusetts. To manufacture and deal in wheels and tires for automobiles; also accessories.

Thames Tire Corp., July 30 (New York), \$1,200. G. D. Smith, Bedford Centre; E. A. Jones, Nyack, both in New York; S. Richert, Atlantic Highlands, New Jersey. To manufacture rubber tires.

United Rubber Co., Limited, February 11 (Canada), \$1,000,000. Charles H. and Leonard L. Stanyon; William B. and Norman B. McPherson; M. D. Gray—all of Toronto, Canada. Principal office, Toronto, Canada.

Youngs Rubber Corporation, August 9 (New York), \$100,000. A. R. Chisholm, 10 West 51st street; S. A. Foote, 114 West 79th street—both of New York City; M. L. Youngs, 159 South Second street, Mount Vernon—both in New York. Principal office, 75-77 Spring street, New York City. To manufacture atomizers and molded rubber goods for the wholesale druggists' trade. Purchased business of Fay & Youngs, Inc., and of Fay & Youngs Rubber Corporation.

AMERICAN DUNLOP BUILDINGS NEARING COMPLETION.

Work on the new Dunlop tire plant in the United States, to be operated under the name of Dunlop Tire & Rubber Co., is progressing very rapidly.

The site embraces 214 acres on River road, half a mile north of the city line, Buffalo, New York. Its location on the Niagara river insures adequate water supply and direct rail communication to all parts of the country. Electric current will come from Niagara Falls and Buffalo. Some steam power will be used, however.

The plant consists of nine factory buildings, 560 by 120 feet, and a warehouse four stories high, 546 by 162 feet, the whole providing a floor space of 30 acres. The factory buildings are one-story monitor type, of structural steel with concrete foundations, and the warehouse is of concrete. The plan shows an arrangement in groups, each of three parallel buildings so spaced that the capacity of the plant can easily be doubled by the addition of duplicate buildings. Employees will pass to their respective places through covered roadways connecting the buildings, materials and finished products being transported through the same

system. This arrangement is expected to increase the efficiency of tire manufacturing. There is a system of conduits or subways to carry water pipes, steam pipes and electric wires to all parts of the factory.

Exceedingly rapid construction is being attained, the first ground having been broken March 16; the first concrete poured April 7; the first steel erected April 26 and the roofing commenced about August 1.

An estimated capacity of 12,500 tires daily is being provided for. Cord pneumatics, including giant pneumatic truck tires and tubes, and also solid truck tires, will be made in all sizes, including Ford and motorcycle sizes. Present plans do not include the manufacture of fabric tires. Production will start very early in 1921.

A textile mill at Utica, New York, has been purchased where cord fabric for the new tire plant will be produced. In the near future a factory will probably be constructed as part of the Buffalo plant for the manufacture of Dunlop "Vac" golf balls.

Previous references in THE INDIA RUBBER WORLD to the new Dunlop plant have been made under the name Dunlop America Limited, which was incorporated in New York State December 5, 1919.

KENYON'S EASTERN SALES MANAGER.

FRRIENDS of Franklin G. Hill, who has taken over the eastern sales management for the C. Kenyon Co., Inc., Brooklyn, New York, say that he is big enough for the job, and perhaps the biggest man in the tire trade. As he stands six feet three inches and tips the scale at 255 pounds, none will dispute it. Quite apart from these facts, however, his experience has been such as to render him a big man in the tire trade in quite a different sense.

A native of Bradford County, Pennsylvania, where he was educated in the public schools, commercial college and normal school, graduating in 1902, he began his career in the rubber industry with the Diamond Rubber Co. in 1905. The following year he went to the Continental Caoutchouc & Gutta Percha Co., of Hanover, Germany, and in 1907 took over the eastern distribution of Republic tires and tubes, becoming vice-president of the Republic Rubber Co. of New York and also of the Petler Shock Absorber Co.

Mr. Hill resides at Freeport, Long Island, and has been active in politics for several years in Nassau County. He is an Elk and a Mason.



FRANKLIN G. HILL.

PERSONAL MENTION.

F. C. Ryan, with the New York City office of the New Jersey Zinc Co., Inc., sailed on August 11 aboard the Grace liner *Santa Ana* for Valparaiso and other South American west coast ports.

C. E. Little has been appointed New York representative of the Tru-matic Tire & Tube Co., a Delaware corporation, with office at 106 Duane street, New York City.

A. F. Bearsdag has been appointed New York representative for the Netherlands Corporation for Oversea Trade, Holland, capitalized at \$5,000,000, with office at 220 Broadway, New York City.

Ernest Schulthess, a mechanical goods salesman well known in New York City, is a director in the United Tire & Export Co., 26 Cortlandt street, New York.

W. A. Brady has been promoted to the management of the New York branch of The McGraw Tire & Rubber Co., succeeding W. H. Hurley, promoted to assistant sales manager in Cleveland, Ohio.

Lloyd Appleton, for 13 years secretary of F. H. Appleton & Son, Inc., Boston, manufacturer of reclaimed rubber, and in charge of the company's New York office, recently resigned to devote himself to other interests. Mr. Appleton is very well known in the industry and many friends will miss his genial personality.

C. B. McKay, who looks after the crude rubber requirements of The Fisk Rubber Co., Chicopee Falls, Massachusetts, will leave Singapore for home about September 1.

Robert F. Whitehead has been appointed by President Wilson to the position of Commissioner of Patents of the United States, succeeding James T. Newton, who recently resigned. Melvin H. Coulston has been appointed First Assistant Commissioner of Patents. Both men have been on the staff of the Patent Office for more than eighteen years.

In Chicago recently, at a meeting of the Chemists' Club, George Slocum, who has been connected with the United States Rubber Co.'s plantations in Java and Sumatra for the last five years, gave an address on "Java and Its Rubber Plantations."

THE RUBBER TRADE IN THE EAST AND SOUTH.

By Our Regular Correspondent.

NEW YORK NOTES.

THE Braender Rubber & Tire Co., Rutherford, New Jersey, has removed its export office from 32 Broadway to 132 Nassau street, New York City.

The Prospect Tire & Rubber Co., Buffalo, New York, has increased its capital from \$500,000 to \$1,000,000.

The Holly-Wood Chemical Co., 101 Beekman street, New York City, has just been established to deal in rubber makers' chemicals, pigments, and colors. These include sulphur, zinc oxide, talc, whiting, dry colors, antimony, etc. A. P. Gottfried, widely known in chemical circles, and S. F. Demant are at the head of the company that maintains branches in Baltimore, Philadelphia, Buffalo and San Francisco.

The shipping agency business established in New York City for nearly 60 years by Booth & Co. and Booth & Co., Inc., will hereafter be carried on under the name of Booth American Shipping Corporation, with offices at the same address, 17 Battery Place, and without change of management or personnel. The company operates steamers between Amazon river ports and New York.

The United States Rubber Co., New York City, has promoted F. J. Nute, formerly salesman at Portland, Maine, to the position of branch manager in the same city.

The business of the Fay & Youngs Rubber Corporation, and of Fay & Youngs, Inc., has been purchased by a newly incorporated company, Youngs Rubber Corporation, which will have its main offices at 75-77 Spring street, New York City. The officers are: Merle L. Youngs, president and treasurer; William McKinney, vice-president; and Jesse A. Cole, secretary. These are also directors, besides Messrs. John E. Conklin, Samuel A. Foote, A. R. Chisholm, and R. R. Carter. The company will manufacture atomizers and molded rubber goods for the wholesale druggists' trade.

The Multibestos Co., Walpole, Massachusetts, has established a branch office at 105 West 63d street, New York City, with Mr. Schacht as manager.

The Philadelphia Rubber Works Co., Akron, Ohio, has purchased a 100-acre tract of land adjoining the property of Dunlop

America Limited in Buffalo, New York, but will not develop the premises at present.

Jean Nehmelman has been appointed sales manager of Madison Tire & Rubber Co., Inc., New York. Sylvan E. Weil will continue as assistant sales manager. George Shortmeier has been appointed manager of the New York branch. All have been connected with the company since its inception.

The College Point Rubber Mold & Engraving Co., College Point, New York, has changed its name to "College Point Mold, Die Sinking and Engraving Co."

L. Littlejohn & Co., Inc., crude rubber importers, has removed its offices from No. 138 to Nos. 133-137 Front street, New York city.

Elbert & Co., dealers in oils, including cotton, coconut, palm, and copra, removed several months ago from 71 Wall street to 27 William street, New York City.

The Gordon Suspender Co., New Rochelle, New York, has increased its capital stock to the following: 150 shares preferred, par value \$100; 150 shares common, no par value; \$15,750 to carry on business.

CONNECTICUT NOTES.

The Seamless Rubber Co., New Haven, Connecticut, has purchased the dipped goods department of The Miller Rubber Co., Akron, Ohio, including household, surgeons' and acid rubber gloves, finger cots, dipped bathing caps styles Nos. 357 and 358, drainage gauze covers, dilator covers, and toy balloons.

The United States Rubber Co., New York City, has promoted L. W. Jerauld, formerly salesman in Boston, to the position of branch manager at the Hartford Rubber Works, Hartford, Connecticut.

Goodyear Cotton Mills, Inc., Goodyear, Connecticut, has canceled operations looking to the immediate building of a 500-foot spinning mill, and the structure will not be erected until some future date.

PENNSYLVANIA NOTES.

George W. Kavanaugh, Inc., manufacturer of fabrics for the rubber trade, has removed from 216 Chestnut street to 38 North Second street, Philadelphia, Pennsylvania.

The officers of the Prudential Tire & Rubber Co., 816 Commerce Building, Erie, Pennsylvania, include Fred A. Seiberling, president, and D. L. Stouch, secretary and treasurer.

The Southwark Foundry & Machine Co., Philadelphia, Pennsylvania, has increased its sales engineering staff by the addition of James T. Lee, formerly vice-president in charge of sales of the Hanna Engineering Works, Chicago, Illinois. The Southwark company is planning to add a full line of pneumatic and hydro-pneumatic riveters and foundry molding machines to its present line of hydraulic and power machinery, and thereby broaden its field of activity.

SOUTHERN NOTES.

The Continental Tire & Rubber Co., Gulfport, Mississippi, is now receiving machinery for its factory and expects to be in operation by October.

Fred B. Geary has been appointed branch manager of the Madison Tire & Rubber Co., New York City, with headquarters at 303 Peachtree street, Atlanta, Georgia.

The Delion Tire & Rubber Co., Baltimore, Maryland, has purchased the plant and equipment of The Dreadnaught Tire & Rubber Co. of the same city and will make extensive alterations and improvements. Considerable new machinery will be installed and it is expected that the plant will be in operation about the middle of November, producing Delion tires and tubes. The officers of the company are: John W. Price, president; W. C. Price, vice-president in charge of sales; R. B. Arnold, vice-president in charge of manufacture; and R. L. Swats, sales manager.

THE RUBBER TRADE IN NEW JERSEY.

By Our Regular Correspondent.

TRENTON TIRE MANUFACTURERS are experiencing a little slump in the tire market at the present time. This unusual condition is due principally to transportation difficulties. Owing to the shortage of freight cars the automobile manufacturers have been unable to secure needed materials, and were compelled to cancel orders for thousands of tires. As soon as this situation is remedied rubber manufacturers expect to receive large orders for tires and tubes. Business in the mechanical rubber goods trade has been very good for some time and manufacturers expect it to continue.

The Ajax Rubber Co. was the only Trenton concern forced to lay off a number of employes because of these conditions. The company has laid off about 250 tire makers, but according to officials of the company they will be put back to work within a short time. It is not thought by heads of other rubber concerns in Trenton that the situation will grow any worse in this section.

Two more Trenton rubber concerns have decided to enlarge their plants to take care of future trade. The Thermoid Rubber Co., which recently let a contract for a big addition to the plant in Hamilton township, will erect an additional story to the main plant. The new story will be 80 by 200 feet, of reinforced concrete and steel, and will cost \$50,000. The Hamilton Rubber Manufacturing Co. will build a two-story addition to the plant on Mead street. The building will be 20 by 40 feet of brick and steel and will cost \$15,000. The Joseph Stokes Rubber Co. has completed the erection of a steel water tank of 70,000 gallons capacity with a 125-foot tower. The Acme Rubber Manufacturing Co. recently let a contract for a big addition, and the Ajax Rubber Co. recently completed large additions.

The employes of the Essex Rubber Co. and the members of their families, numbering approximately 500, held an annual outing at Burlington Island Park recently. The rubber plant was closed for the day and the trip was made on a steamer on the Delaware River. There were various field and aquatic sports.

Some of the rubber factories of Trenton have suffered heavy losses through systematic thefts of tires during the past year and the police of Trenton now believe that they have put a stop to these wholesale robberies by the arrest of several young men. The Empire Rubber Co. alone lost nearly \$3,000 worth of tires. How the tires were taken from the plants is a mystery. A tire concern at Perth Amboy, where the stolen goods were sold, was raided by the police and the proprietors arrested. The tires stolen were of the best grade and easily disposed of at the "fence" raided by the police.

The United & Globe Rubber Co. recently completed the erection of a new tower and steel tank with a capacity of 100,000 gallons of water. This is in addition to the company's other tanks and will give better service in case of fires in the future.

The Semple Rubber Co., Trenton, is completing a big order for tires for European dealers and expects more orders from abroad during the coming fall.

The Bergougnan Rubber Corporation, Trenton, New Jersey, has practically completed its plant additions which have been under construction for a number of months. These consist of a two-story unit of the same size and type as the other two main units of the plant, a warehouse, a rubber cement mixing and storage building, a machine shop, a carpenter shop, and a large garage and repair shop for motor trucks and passenger cars. The sidings which connect with the Pennsylvania railroad are also being improved as well as the facilities for handling and storing coal.

The Acme Rubber Manufacturing Co., Trenton, has broken ground for a new factory building, 90 by 300 feet, to be used

entirely for the manufacture of molded hose. It will be of concrete and steel construction and the company hopes to occupy it by November 1.

Capitalization of the Joseph Stokes Rubber Co., of Trenton, New Jersey, has been increased from \$300,000 to \$5,050,000 by the filing of a certificate with the Secretary of State amending the charter of the company. This increase in the capital of the Stokes company is in line with expansion of the business, which has grown tremendously in the last few years. The company recently purchased several properties on Taylor street for eventual plant extension. A modern office building is now being erected.

Harry Weida, vice-president of the India Rubber Co., New Brunswick, New Jersey, recently entertained the members of the office force with a motor trip to Asbury Park and other points along the New Jersey coast. The guests also enjoyed a shore dinner and a motor boat trip up the Shrewsbury River.

MISCELLANEOUS NEW JERSEY NOTES.

The Braender Rubber & Tire Co., Rutherford, New Jersey, has completed its new factory and is running at full production.

A. R. de Santos, of the Braender Rubber & Tire Co., has returned from a nine months' trip through Spain, Italy, Switzerland, Germany, France, Holland, Denmark, Norway and Sweden.

The Compound Belting Co., Nutley, New Jersey, has changed its name to the Maywald Rubber Co.

Dr. W. F. Zimmerli is now the chemist of the Howe Rubber Co., New Brunswick, New Jersey, devoting all his time to this organization.

The Michelin Tire Co., of Milltown, New Jersey, has protested to the town authorities about the proposed tax on jitneys carrying employees from their homes to the plant. The company carries nearly 1,000 persons daily in the jitneys and protests against paying a fee for each bus.

THE RUBBER TRADE IN MASSACHUSETTS.

By Our Regular Correspondent.

BOSTON NOTES.

RUBBER COMPANIES were well represented at the National Shoe and Leather Exposition and Style Show held in Boston recently. The United States Rubber Co. showed Uskside soles and top lifts, also Spring Step heels. The booth was in charge H. A. Derry, and Miss Betty Marquis, a model, wore shoes of leading manufacturers on the style runway with Uskside and Spring Step products.

The Hood Rubber Co. booth was in charge of Mr. Shepard, and "The Red Man" and woman, models which were replicas of the well-known Hood sign boards, displayed a variety of rubber and fabric footwear, including a man's walking shoe of brown canvas; a military-heel house-shoe; a molded-sole basketball shoe; a one-strap shoe; a cross-strap shoe in brown; a white Flexipac shoe for coal miners; a pressure-cured black rubber boot with fabric lining made to withstand the action of acids and oils; and the Society gaiter with five eyelets, ribbon laced, of Jersey cloth in black with high heel.

The Goodyear Tire & Rubber Co. showed Neolin soles and Wingfoot heels, while the Wids Co. and the Foster Rubber Co., with William P. Noll in charge of the Cat's-Paw heel exhibit, were well represented.

The Converse Rubber Shoe Co. featured its Big Nine shoe for hard, everyday use, athletic sports and camping.

The Portage Tire Co. has moved to larger and better quarters at 805 Beacon street, Boston, the former Boylston street branch having proved inadequate to handle the increasing business in Skidlock tires. C. E. Aldridge is New England manager.

The B. F. Goodrich Rubber Co. recently removed its offices to

larger and more spacious quarters in the firm's handsome fire-proof building at 867 Boylston street. The Boston tire division is located on the first floor, with the administration offices on the second. The office of the district manager, F. T. Moore, is on the sixth floor, and surrounding him there, and on the fifth are the offices of the district sales executives. The fourth and third floors are occupied by the credit, bookkeeping and general operating departments.

The Davidson Rubber Co., Boston, in line with its policy of manufacturing only a few specialties of high grade, is featuring its line of rubber gloves, for the manufacture of which it maintains a complete dipped goods plant with modern equipment for making high-class goods.

F. H. Appleton & Son, Inc., Boston, has changed the name of the organization to Appleton Rubber Co. F. H. Appleton is president.

The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, has appointed W. P. McGlynn its Boston representative, succeeding R. I. Winterringer, transferred to Cleveland.

The United States Rubber Co., New York City, has promoted J. P. Haney, formerly branch manager at Boston, to the position of district manager, and H. E. Crocker, formerly branch manager at Providence, to succeed Mr. Haney as Boston branch manager.

MISCELLANEOUS MASSACHUSETTS NOTES.

A two-day institute on industrial Americanization, conducted under the joint auspices of the Harvard Summer School and the Associated Industries of Massachusetts was held in Cambridge late in July. Members having, or contemplating, classes in English for alien employees, sent representatives and much of value in solving this great problem was developed by talks and discussions. Among the speakers were J. F. Tinsley, general manager, Crompton & Knowles Loom Works, Worcester, who spoke on "Methods and Achievements"; E. A. Fiesinger, educational director, Solvay Process Co., Syracuse, New York, who talked on industrial Americanization in the Empire State, and Miss Rose O'Toole, director of factory classes, United States Rubber Co., whose subject was "Factory Classes in Boston."

Owing to the impossibility of securing enough stitchers in Malden, the Converse Rubber Shoe Co. has established a stitching room at Concord, where 40 to 50 young women are now turning out better than 1,100 pairs of leather-trimmed tennis tops a day. The tops leave the Malden factory all cemented and go back from Concord completely stitched and eyeleted, ready to be laced on. A regular truck service is maintained between the two places.

Among the Massachusetts industrial concerns which give their employees a week's vacation with pay are the Boston Rubber Shoe Co. and the Converse Rubber Shoe Co., both of Malden.

To relieve the New England coal situation manufacturers are being encouraged to use anthracite coal screenings mixed with bituminous coal. The Boston Woven Hose & Rubber Co., Cambridge, has gone one better and is burning 200 tons per week of wharf screenings mixed with bituminous coal. By utilizing this fuel the company has been able to haul the tonnage in trucks without resorting to open-top railroad cars.

The Monatiquot Rubber Works Co., reclaimer and manufacturer of "naturized" rubber, South Braintree, has completed a second siding on the east side of its extensive property, which will open it up for development. In addition, the company has storage space for one or two years' supply of coal. This is an insurance against a repetition of last winter's state of affairs when New England manufacturers were confronted with the danger of having to close down their plants because of lack of coal. The company now has all its executive and clerical offices installed in the new office building at South Braintree.

E. S. Kochkersperger, of the Hood Rubber Co., Watertown, has been nominated a member of the executive committee of the

Safe Roads Federation of Massachusetts by the Associated Industries of Massachusetts. The object of the Federation is to reduce highway accidents through education and arousing of public sentiment.

The new canvas shoe prices of the Hood Rubber Co., Watertown, effective August 2, show a general advance of 25 to 30 per cent over last year's prices.

The baseball team of the Apsley Rubber Co. Athletic Association, composed of factory workers of the Apsley Rubber Co., Hudson, Massachusetts, holds the record of winning 12 out of 13 games played this season, including those with teams from the American Rubber Co. and the Boston Woven Hose & Rub-



APSLEY RUBBER CO. BASEBALL TEAM.

ber Co., both of Cambridge, Massachusetts. The Apsley team has scored 118 runs to opponents' 32, and 159 hits to opponents' 73, while its batting average is .327 to opponents' .170. Norman has pitched nine games, winning eight, with a record of 104 strike-outs. Plouffe has pitched four games, winning all, with a record of 31 strike-outs.

The season's entire output of men's one-buckle and four-buckle cashmerette gaiters at the Converse Rubber Shoe Co., Malden, is being made by the new machine-making process described recently in *THE INDIA RUBBER WORLD*. Constant experimenting with the machines and patterns has brought these shoes to the point where they are not only a commercial success, but they show wearing qualities superior to the hand-made arctic. The bulk of the output at the present time is the four-buckle shoe.

The Tyer Rubber Co., Andover, Massachusetts, has made a number of changes in its offices in No. 1 factory. More floor space has been added and better lighting arrangements installed. A conference room for committee sessions has also been added. The factory was closed from July 31 to August 9 for the annual vacation of the employees. An active campaign of education in safety will be conducted among employees during the next few months, the safety committee having been considerably increased and the work reorganized.

The President Suspender Co., Shirley, Massachusetts, has purchased a two-story factory and ten acres of land in Clinton, in the same state, and will equip the factory with looms for weaving elastic web, together with the necessary spoolers and warpers. It is hoped to begin production in September. This is the second shop acquired by the company in Clinton, a stitching room for finishing suspenders and garters having been established there a year ago. The officers of the company are: C. Fred Edgarton, president; David C. Lash, vice-president and general manager; and F. H. S. Hyde, vice-president. The company is also selling agent for the Knickerbocker Suspender Co.

Humphrey O'Sullivan of Lowell, Massachusetts, inventor of the O'Sullivan rubber heel, has been made a knight of St. Gregory the Great by the Pope. This honor recognizes the charitable work done by Mr. O'Sullivan for the Catholic churches of Lowell, and his many good deeds and acts of generosity.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

AUGUST saw the vacation period and the annual outing festivities attain their zenith for the year, it being a month marked by unusual social activities. Factory outings were one of the features and the reports from every one proclaimed the satisfaction and enjoyment which resulted from these respites from work.

The second annual outing of the overseers of the Hope Webbing Co., Pawtucket, was held July 24 at the Hummocks, in Hamilton. The party left the company's plant in automobiles at 9 o'clock, arriving at noon, when a luncheon was served, at which there were about 75 persons present. In the afternoon a baseball game was played, followed by a sports program, which included several races and exhibition diving. At the conclusion the gathering enjoyed an old-fashioned clambake.

A full-course Rhode Island clambake, athletic events, and a dance were features of the third annual outing of the Mutual Benefit Association of the Davol Rubber Co., at Emery Park, and attended by 250 members and friends. After lunch a baseball game was played, followed by the clambake in the afternoon and dancing. Prizes were awarded to the first and second place winners of the various events.

Another outing of importance was the third annual field day of the employees of the Tubular Woven Fabric Co., held at the grounds of the Warwick Club, July 31. A light lunch was served, followed by a course dinner in the afternoon and a baseball game and a program of sports. Music was furnished by an orchestra and dancing was enjoyed until 5 o'clock, when the party left the resort for Rocky Point and at 9 o'clock the return trip was made.

The fifth annual outing of the Revere Rubber Co., to Lake Pearl on July 31, was enjoyed by more than 1,500 employees. A variety of amusements was offered; competition in athletic events, prize dancing and riding in launches and on the merry-go-rounds. In the dancing contests Robert Clark and Miss Egan won the first prize in the waltz. The married men asserted their superiority over the bachelors in a baseball struggle and the solid tire department took the measure of the engineers' department in the tug-of-war.

The outing of the employees of the Atlantic Tubing Co., at Duby's Grove on August 7 was a success. The dinner was a big feature but there were many games that were decidedly interesting. The baseball game between the married and single men was won by the "free-for-alls." There was a tug-of-war and Harry L. Lippitt, who was playing host for the occasion, was captain of the winning side.

More than 3,500 employees of the Alice and Millville rubber mills of the Woonsocket Rubber Co. at Woonsocket and Millville, and of the Lawrence Felting Co., were the guests of the Woonsocket Rubber Co., mill management, at an outing on the company's recreation grounds off Fairmount street, Woonsocket, on August 7. The festivities began at 1 o'clock and ended at 6:30 o'clock. Early in the afternoon the Millville team defeated the Alice nine in a baseball game. Dancing was enjoyed on a dance floor erected in the grove, while a large number of booths of various kinds provided amusement and at some of them refreshments were distributed free.

The National India Rubber Co. has begun the operation of a plan by which visitors may be shown through the entire factory by Miss Dorothy Hillard, who has been appointed factory

guide. Factory employes are also allowed to take advantage of the services of the guide during working hours by making an appointment through the industrial relations bureau. During the past month many of the employes have taken full advantage of the privilege.

The new branch of the National India Rubber Co., of Bristol, that has been established in the old Perry Mill building on Thames street, Newport, began operations on Monday, July 26, about 75 employes taking up the work at the start. The branch will, for the present, make the tops for the shoes. Later a department will probably be established for the making of the shoes. A number of young women from the Bristol plant went to Newport to assist in getting the new plant under way and to give instructions.

Some months ago the I. T. S. Rubber Co., of Elyria, Ohio, brought an infringement suit before Judge Arthur L. Brown in the United States District Court for Rhode Island, against the United States Lace & Braid Manufacturing Co., of Auburn, R. I., declaring that a rubber heel as manufactured by the Rhode Island concern infringed on the patent rights of the plaintiff. Judge Brown issued an order stopping the defendant from the further manufacture of the heel in question. Since then the defendant has made certain modifications in the heels, and on July 27 asked permission of the court to manufacture them. The defendant was told by Judge Brown, in an opinion handed down from the bench, that he would not consider the new heel an infringement.

The Mount Hope Spinning Co. closed its mills at Warren, Rhode Island, at noon July 31 for a period of two weeks, not for lack of orders, however. By reason of the increasing business a new mill was erected last spring, but unforeseen obstacles prevented the machinery installation. During the shut-down the entire plan of the mill was changed as to the location of the machinery and much of that located in the old mill was transferred to the new one, and the new machinery brought overland by auto trucks from Taunton and Lowell, was set up in the old structure. When running in full the capacity of the concern will be more than doubled. The Mount Hope Spinning Co. manufactures yarn for automobile tire fabric, and has large orders on hand that ensure several months' steady business.

The Kielstone Rubber Co., a Massachusetts corporation, has leased the factories of the Lynn Rubber Manufacturing Co., Warren, Rhode Island, and has started operations. The sales department has been established at 11 High street, Boston, in charge of M. S. Klein, sales manager. The company is planning to increase the output of the rubber specialties made by the Lynn Rubber Manufacturing Co. several times, and, in addition, will make a high grade rubber heel. The new company expects to employ more help within the next 30 days, as soon as additional machinery and equipment can be installed. The officers and directors of the company are as follows: president, Eliston H. Bell; vice-president and sales manager, Myer S. Klein; treasurer, J. Everett Stone; secretary and clerk, Robert J. Holmes; directors, L. P. Bosworth, and E. K. Watson, Warren; R. J. Holmes, M. S. Klein, George Marsh, and E. H. Bell, Boston. Mr. Stone, treasurer of the company, will be in Warren and will have full charge of the manufacturing and business of the concern. J. W. Long, former president of the Lynn Rubber Manufacturing Co., is still with the new concern and will continue as superintendent in charge of the manufacturing. W. L. Castillo, former assistant purchasing agent of the Plymouth Rubber Co., is the purchasing agent of the Kielstone Rubber Co. and L. E. Libby has assumed the position of production engineer.

Work is to be started in a short time on a large addition to the plant of the American Wringer Co., Woonsocket. The extension will be on Pond street and is to be 182 by 66 feet with a projection in the rear, 28 by 30 feet. There will be one high story and one normal one, the height to be 45 feet. It will have steel

frame, steel sash and brick walls and the work will cost approximately \$100,000. A freight elevator will also be installed.

E. T. Richardson, formerly branch manager of the United States Rubber Co. at Portland, Maine, has been promoted to the position of branch manager at Providence.

Walter Smith, of New York, formerly commercial agent for the New York Central Railroad, has been appointed traffic manager for the National India Rubber Co., at Bristol. James Cruickshanks, who has been holding the position temporarily, has been appointed assistant superintendent of central stores.

PAUL W. LITCHFIELD, FACTORY MANAGER.

PAUL WEEKS LITCHFIELD, vice-president and factory manager of The Goodyear Tire & Rubber Co., Akron, Ohio, has recently completed twenty years of service with the company and is as proud of the gold service pin presented to him as any veteran workman who has been similarly honored.

Mr. Litchfield is of New England extraction, having been born in Boston in 1875, educated in the public schools and English High School of that city and graduated from the Massachusetts Institute of Technology in 1896 with a B.Sc. degree in chemical engineering. He was first employed as a surveyor for the Massachusetts Metropolitan Park Commission. After six months he entered the employ of L. C. Chase & Co., Boston, manufacturer of tire and carriage cloth, which was his introduction to the rubber industry.



PAUL W. LITCHFIELD.

His next step came with a transfer to the New York Belting & Packing Co., Passaic, New Jersey, as foreman of the molded goods and packing departments. From there he went to the superintendent's chair of the International Automobile & Vehicle Tire Co., which later became the Michelin Tire Co., of Milltown, New Jersey.

In 1900 he became associated with The Goodyear Tire & Rubber Co. as factory manager, a position in which he has developed remarkable capacity under an ever-increasing burden of responsibility that now also includes the offices of vice-president and director, and president of The Goodyear Cotton Mills, Inc., Killingly, Connecticut.

Mr. Litchfield has been a keen student of the human element in factory management and his influence has made the Goodyear company a leader in the modern idea of industrial relations and welfare work. In 1915, at a banquet tendered him by the company on the occasion of his fifteenth anniversary with the organization, he presented a gift of \$100,000 to be established as a welfare fund for the benefit of factory employes. He is a firm believer in the participation of labor in the management and ownership of large industrial plants, and the large number of Goodyear employe stockholders and the elective legislative body made up of employes and known as the Council of Industrial Relations to regulate shop affairs are but practical applications of

his theories. The outcome of this daring but apparently successful innovation is being watched with much interest by the entire industrial world. Goodyear Industrial University was also a child of his brain. It is not surprising, therefore, that he is as well liked and respected by those working under him as by his business associates.

Mr. Litchfield is a member of The Rubber Association of America, of which he was a director in 1917; a member of the Society of Automotive Engineers, before whom in 1915 he read a scientific and practical paper on "The Size and Inflation of Pneumatic Tires" that is still the standard treatise on that subject; and a member of the Rotary Club, Akron City Club, and Akron University Club, and a Knight Templar.

THE RUBBER TRADE IN OHIO.

By Our Regular Correspondent.

F. A. SEIBERLING, president of The Goodyear Tire & Rubber Co., and **C. B. Raymond**, vice-president of The B. F. Goodrich Co., recently reviewed the outlook for Akron, the rubber center of the world, for the official publication of the Akron Chamber of Commerce, and pointed out that the present lull in the trade is transitory and that the future appears brighter than ever before. The industry is based upon solid foundations and the fact that the number of automobiles in the United States and the world will be doubled within a few years makes these predictions safe.

C. B. Raymond said:

"We are facing facts. Akron business men foresaw months ago that these conditions were coming. They are prepared, and being prepared, will be able to weather the storm.

"Legislation for the special benefit of some, regardless of results to others; extravagance of the Government; crying demands for decreases in prices; reckless legislation looking towards the decrease in prices have brought their natural results. People stopped buying. Manufacturers were compelled to curtail.

"Akron will suffer less than many other cities. People may not be buying automobiles. But their old cars are running and are using up tires.

"The pendulum is bound to swing back. It was inevitable the present conditions should come. It is inevitable better conditions will return."

F. A. Seiberling said, in part:

"The business situation in this country is acute at this time, while adjusting to the shock of restricted credits applied by the Federal Reserve Banks and the effects of the railroad strike. Within a few months this extreme pressure will be removed, but the orderly process of deflation of war values will move quietly and steadily on the equilibrium.

"So far as Akron is concerned, we have reached bottom in the production of tires. Abnormal stocks over the country are being steadily absorbed and the curve of production within a few months will be steadily upward.

"Eight million cars are now running in this country; within five years this number will approximate fifteen million cars—all with tires, the major part of which must be furnished by Akron. The rubber industry is on a solid foundation, unsurpassed by any other industry in this country.

"This is the time for sensible optimism. Everyone who is conscientiously desirous of doing his duty to himself, to Akron, to his country, will, in a time like this, stand by the guns, keep faith, do more work, and keep cool."

George D. Bates, vice-president of the First-Second National Bank, said:

"It is the Federal Reserve banking system backed by the great banking institutions which is responsible for heading the nation from a wild orgy of spending back to the safe and sane path which will ultimately lead to the greenest pastures in which this country has ever found itself.

"Business was rushing wildly on. The end could only be a terrible precipice. Quietly the word went out credits must be curtailed. Inflation must stop. Expansion not absolutely necessary ceased, and over night the great country was headed from certain ruin back to the road leading to prosperity."

AKRON NOTES.

Although a general scarcity of coal has been evident throughout Ohio because of an Interstate Commerce Commission order compelling the sending of large amounts of coal to the Northwest via the Great Lakes, Akron has a good supply on hand and when that is exhausted the mines owned by the Akron companies will be able to supply the deficiency. Since the strike of last year the companies purchased and have operated mines in the coal fields.

The building of aircraft will not be deterred in Akron because of a fire of unknown origin which burned three machines in their hangar at the Wingfoot aviation station owned and operated by The Goodyear Tire & Rubber Co. The hangar has been repaired and new machines are being assembled to take the place of those destroyed. One of the machines, the D-1, recently described in *THE INDIA RUBBER WORLD*, belonged to the government at the time it was burned. No one was injured in the fire and the losses were covered by insurance.

Theodore E. Smith, editor of the "India Rubber Review," Akron, has been appointed a member of the Honorary Advisory Council of the Fifth International Exhibition of Rubber, Other Tropical Products and Allied Industries, to be held in London, England, in June, 1921.

The Firestone Tire & Rubber Co., Akron, recently took an inventory, giving employes a week-end vacation of two days.

Mark L. Felber, formerly editor of "The Press," has been appointed editor of "The Firestone Non-Skid," Firestone Park, Akron.

C. H. Sorrick and **J. F. Cast**, manufacturers' sales manager and assistant manufacturers' sales manager, respectively, of the Firestone Tire & Rubber Co., Akron, have qualified for admission to associate membership in the Society of Automotive Engineers.

In a letter sent to the tire trade early last month, The B. F. Goodrich Co. guarantees present schedules until November 1, stating that in the event of any unforeseen condition arising which would enable a general reduction in present schedules prior to November 1, they will stand back of their guarantee by protecting Goodrich dealers on all stocks on hand unsold at the time of such reduction which were purchased between the present date and November 1.

Frank A. Seiberling, president of The Goodyear Tire & Rubber Co., Akron, has been elected president of the Lincoln Highway Association, succeeding **Henry B. Joy**, who is leaving the United States for a year. This is Mr. Seiberling's second election to the office.

The Miller Rubber Co., Akron, has sold its dipped goods department to The Seamless Rubber Co., New Haven, Connecticut, due to increased demand for automobile tires. The company will continue to make its remaining lines of druggists' sundries and all other present lines of products.

The Firestone Tire & Rubber Co.'s athletics have been in charge of **Paul P. Sheeks** as athletic director for a number of months. He was responsible for the first undefeated football team at Wabash College.

Arthur H. Leavitt, who last autumn resigned from the sales department of The B. F. Goodrich Co., Akron, to accept a position as assistant sales manager of The Akron Rubber Mold & Machine Co., has been appointed general sales manager for The Amazon Rubber Co., Akron, thus resuming connection with the tire business.

CLEVELAND NOTES.

The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, has promoted **C. E. Pumphrey** to the position of general

sales manager, succeeding H. M. Bacon, resigned. Mr. Pumphrey was formerly assistant sales manager and has been with the company seven years.

W. H. Hurley, formerly manager of the New York branch of the McGraw company, has been made assistant sales manager in Cleveland.

R. I. Winterringer, formerly the McGraw company's Boston representative, has been appointed in charge of the Cleveland territory, succeeding G. E. Bovis, promoted.

H. G. Couturier has been made sales promotion manager of the McGraw company at Cleveland, having been transferred from Chicago. This position is in a newly created department.

The United States Rubber Co., New York City, has promoted W. T. Irwin, formerly branch manager at Youngstown, Ohio, to the position of branch manager at the Cleveland office. C. L. Wood, formerly salesman at the Cleveland branch, is promoted to be branch manager at Youngstown.

The McElrath Tire & Rubber Co., Cleveland, Ohio, has appointed E. S. Curtis sales manager and W. D. Richards, factory superintendent. The H. B. Bixler Co. has been retained as consulting engineers. The company's new factory, 100 by 300 feet, is well under way and will have 45,000 square feet of floor space. Machinery equipment sufficient to make 1,000 cord truck tires will be installed, as the company will specialize in machine-made tires of this kind. The equipment has already been purchased. The premises cover 12½ acres of land in Ravenna, one of the suburbs.

The Advertising Managers Council of the Motor and Accessory Manufacturers' Association, comprising the executives of the principal companies interested in automotive equipment, will hold a convention at Camp Nela, Nela Park, Cleveland, Ohio, on Friday and Saturday, September 17-18, 1920. Tents will be erected to accommodate the visitors and sports will be enjoyed. It is expected that the recent developments in the automotive industry will make this meeting both interesting and important. E. C. Tibbetts, advertising manager of The B. F. Goodrich Co., Akron, Ohio, is chairman of the executive committee which is working on the program for the meeting.

MISCELLANEOUS OHIO NOTES.

The Dayton Rubber Manufacturing Co., Dayton, Ohio, through the disposition of \$3,000,000 of preferred stock, is quadrupling its present plant capacity. The additions are being built in accordance with the original plan when the first unit was erected in 1917. The property covers 22 acres and the company has no bonds or mortgages of any kind on it. "Dayton Airless" and "Dayton Thorobred" cord and fabric tires are being manufactured. J. A. MacMillan is president.

The Lancaster Tire & Rubber Co., Columbus and Lancaster, Ohio, has appointed Richard Gibson, Jr., technical superintendent. He formerly held a similar position in the tire department of the Hewitt Rubber Co., Buffalo, New York, and has also been tire development engineer of the Republic Rubber Corporation, Youngstown, Ohio, and assistant chemist of the Racine Rubber Co., Racine, Wisconsin, and of the Kelly-Springfield Tire Co., Akron, Ohio.

The Akron Maderite Tire & Rubber Co., Newton Falls, Ohio, has changed its name to the Trumbull Tire & Rubber Co.

The Republic Rubber Co., Youngstown, Ohio, was closed down for six days in July, for the regular semi-annual inventory. The pneumatic tire department was shut down until August 16, when it resumed operations. All departments are now running.

The Mason Tire & Rubber Co., Kent, Ohio, has created a factory engineering department in charge of H. W. Sidnell. The entire staff of the department when fully organized will consist of from eight to ten men. E. B. Harvey is manager of the planning division, W. W. Peffers of the raw material department, and

W. S. Agnst will have charge of the tire design department. As a result of the transfer of Mr. Sidnell from the office, A. J. Lauderbaugh has been promoted to the position of assistant secretary and office manager.

An eastern sales district, comprising all branches east of Indianapolis, has been created by The Mason Tire & Rubber Co., Kent, Ohio, in charge of Earl W. McCreery, with headquarters at the factory in Kent. Mr. McCreery was formerly assistant sales manager of the Portage Rubber Co., Barberton, Ohio.

E. K. McMillen has been appointed foreman of the milling department, in charge of mills and calenders of The Mason Tire & Rubber Co., Kent, Ohio, succeeding H. L. Parsons. Mr. McMillen has been connected with the rubber business 17 years, and was formerly with the Firestone Tire & Rubber Co. and The B. F. Goodrich Co., Akron. He comes to the Mason company from the New Castle Rubber Co., New Castle, Pennsylvania.

E. H. Lybrook, for the last year in charge of the electrical construction work of the United States Nitrate Plant, Toledo, has been appointed chief electrician of The Mason Tire & Rubber Co., Kent, Ohio, succeeding the late George J. Murray. Mr. Lybrook has had ten years' experience in electrical work, and is a graduate of Purdue University.

The Allied Belting Co., Greenville, Ohio, has increased its stock from \$60,000 to \$100,000, and will move its factory from Toledo to Greenville, where it is now building a factory to cost approximately \$25,000. George C. Baker is vice-president, and W. R. Graham is factory manager.

THE MID-WEST RUBBER ASSOCIATION'S GENERAL MANAGER.

HARRY STEPHEN VORHIS, who until July 1 of last year was secretary and treasurer of The Rubber Association of America, when he resigned and joined the Gutta Percha & Rubber Manufacturing Co., of New York, and later was made general manager and secretary of the Mid-West Rubber Manufacturers' Association, is well known to nearly everybody in the rubber trade through his former close connection with the industry.

Mr. Vorhis brings to the Mid-West Rubber Manufacturers' Association a broad experience that peculiarly fits him for the work. Under his able management this young association may be expected to redouble its already sturdy stride, for it is growing rapidly. Since Mr. Vorhis assumed his duties in February, fifty new members have been added, making a total of 132, and a "live wire" bulletin service has been inaugurated. Attendance at monthly meetings has increased from about thirty to sixty members and a spirit of friendly cooperation and enthusiasm is being manifested. Both Mr. Vorhis and the Association are to be congratulated.



HARRY S. VORHIS.

THE RUBBER TRADE IN THE MID-WEST.

MID-WEST RUBBER MANUFACTURERS' ASSOCIATION OUTING.

THE FIRST ANNUAL OUTING of the Mid-West Rubber Manufacturers' Association, held at the Hotel Breakers, Cedar Point, near Sandusky, Ohio, August 16-17, was an unqualified success as to attendance and enjoyment. Many rubber men from Ohio accepted the hearty welcome of the Westerners and were amply repaid in the coin of good-fellowship that freely circulates among the rubber men.

An enjoyable dinner was held in the hotel pavilion on Monday evening and on Tuesday morning there were beach sports. The swimming race was won by O. A. Ragsdale of the Hunter Dry Kiln Co., the prize being a golf bag. The fat man's race was won by E. S. Babcox of the Akron Advertising Agency Co., the prize being a silver pen and pencil. The wheelbarrow race was won by K. Hassenzahl, Akron representative of Gove & French and Mr. Rodenbough, Akron representative of F. R. Henderson & Co., the prize being a pin-seal bill-fold to each winner. The fifty-yard dash was won by Henry O'Reardon, advertising manager "Tires," New York City, the prize being a silk umbrella.

Luncheon was held immediately after the sports, after which there was held a brief business session, presided over by Theodore E. Smith of "The India Rubber Review," Akron, Ohio, who addressed the meeting on present conditions in the trade. Jesse E. LaDow, secretary of the Mansfield Tire & Rubber Co., Mansfield, Ohio, gave an interesting account of his travels through the countries of crude rubber production in the Far East. E. S. Babcox, of Akron, said that, while present dull conditions in the tire trade had seemed inevitable, he believed that better business was in store for the trade this coming winter. Interesting remarks were also made by J. E. Allen of the Braender Rubber & Tire Co., Rutherford, New Jersey, Henry O'Reardon of "Tires," Mr. Ragsdale of the Hunter Dry Kiln Co. and by W. F. Harrah of the National-Standard Co., Niles, Michigan.

The following new regular members were elected: Sterling Tire Corporation, East Rutherford, New Jersey, and Hubbell Tire & Rubber Co., 6545 Carnegie avenue, Cleveland, Ohio; new associate members—Cabarrus Cotton Mills, Kannapolis, North Carolina; Edward Lyman Bill, Inc., publisher of "Tires," 373 Fourth avenue, New York City; Akron Industrial Salvage Co., Akron, Ohio; Hunter Dry Kiln Co., Indianapolis, Indiana; Keystone Lubricating Co., Philadelphia and Pittsburgh, Pennsylvania, and National Aniline & Chemical Co., Inc., Akron, Ohio.

A vote of thanks was then passed to the outing committee, consisting of the following: H. S. Vorhis, chairman, who is general manager of the Association; E. T. Meyer of F. R. Henderson & Co., Chicago, Illinois; Paul A. Bloom of Fred Stern & Co., Chicago, Illinois; C. H. Taveniere of Charles E. Wood, Chicago, Illinois; and J. Matthias, Jr., of Mineral Point Zinc Co., Chicago, Illinois.

MISCELLANEOUS MID-WESTERN NOTES.

The A. Plamondon Manufacturing Co., 24 North Clinton street, Chicago, Illinois, is constructing a two-story building at 5301 South Western avenue for pattern storage, as an addition to its new plant into which it expects to move about October 1. J. T. Benedict is treasurer of the company. Shafting, pulleys, clutches, and machine-molded gearing are manufactured.

The officers of the International India Rubber Corporation, South Bend, Indiana, are: George W. Odell, president, treasurer, and general manager; Peter E. Studebaker, vice-president. John C. Witmer is factory manager. The plant is located on the Pennsylvania-Vandalia railroad within the city limits, and the factory buildings are of brick and steel construction. The plant is working night and day producing Odell cord and South Bend fabric tires. A description of the Odell cord tire appeared in our June issue.

The Wawasee Tire & Rubber Co., Syracuse, Indiana, is completing plans for an H-shaped three-story building, each side of the H being 50 by 175 feet and the cross-piece 50 by 60 feet. The power-house, to be separate, will have four 300-horse-power boilers, generators, pumps, a Fairfield coal unloader, automatic sprinkling tank, and two large benzene storage tanks. It is expected that work on the factory will begin soon, and that it will be completed by next spring. The company will specialize in tires and tubes, high-voltage electricians' and acid gloves, etc.

F. R. Granger, formerly head of the service department of the Pennsylvania Rubber Co., Jeannette, Pennsylvania, has been appointed general sales manager of the Fort Wayne Tire & Rubber Manufacturing Co., Fort Wayne, Indiana. The company is now placing on the market the "Wayne Rough Shod" and ribbed tread tires in fabric construction and expects to be in full production of cord tires also by the first of next year. The concern also makes "Wayne Supertested" red and gray inner tubes.

The Altenburg Tire Equipment Co., Davenport, Iowa, has voted to increase its capital stock from \$25,000 to \$50,000, to take care of increased business. A new factory site on the Rock Island railroad has been purchased in West Davenport, consisting of 6½ acres, and the foundries and machine shops of the new plant are under construction and expected to be ready for occupancy by September 1. The company manufactures a complete line of tire-building stands, machines, and molds used in the manufacture of tires.

The Columbia Rubber Mills, 176 16th street, Milwaukee, Wisconsin, has bought the plant of the Joerns Manufacturing Co. at Sheboygan, Wisconsin, and will remodel it to be approximately 60 by 140 feet, two stories high, of reinforced concrete. There will be several smaller buildings, also. The equipment will include a general line of rubber machinery, such as calenders, presses, washing machines, tube mills, vulcanizers, mills, etc. Leo Hofmeister is president of the company as well as of the Tomah Rubber Works at the same address.

The Prudential Tire & Rubber Co., Erie, Pennsylvania, has taken over the plant and equipment of the Boone Tire & Rubber Co. at Chippewa Falls, Wisconsin, and is reported to have filed articles of incorporation in that state, with George N. Graham designated as agent.

The Detroit Insulated Wire Co., 641 Wesson avenue, Detroit, Michigan, has contracted for a three-story office building of reinforced concrete.

A western sales district has been created by The Mason Tire & Rubber Co., Kent, Ohio, in charge of H. C. Smith, formerly manager of the Kansas City branch, with headquarters at Kansas City, Missouri. This district will include all branches west of the Mississippi river and the Chicago, Milwaukee, and Indianapolis branches east of the Mississippi. W. S. Deamud succeeds Mr. Smith as manager of the Kansas City branch. He has been with the Mason company as salesman for three years, traveling out of Chicago.

C. H. Connelly has been appointed southwestern manager of The Rubber Products Co., Barberton, Ohio, with headquarters at 2615 Walnut street, Kansas City, Missouri, where George B. Krestinger has also been appointed office manager.

The Terrell Tire & Rubber Co., 1512 McGee street, Kansas City, Missouri, which was incorporated under the laws of Delaware in April to manufacture the Fabri-Cord tire, inner tubes, etc., expects to start production at an early date. The officers are: A. C. Terrell, president and general manager; Otto W. Croy, vice-president; R. L. Meierhoffer, secretary and treasurer; directors—H. F. Zahner and George B. Duden, in addition to the officers.

W. H. Salisbury & Co., Inc., Chicago, Illinois, has just equipped a rubber mill at 411-421 North Morgan street, for the production

of molded and cut rubber goods, tubing, etc. The mill has been in operation about three weeks. The leather belting department of this company will also be under the same roof, thus placing the whole business under centralized supervision.

The Schmelzer Arms Co., Kansas City, Missouri, manufacturer of sporting goods, has moved into its new wholesale building at 2015-2019 Grand avenue, the retail location remaining changed. The company has also changed its name to "The Schmelzer Company," but the organization and personnel will continue as before.

Morton L. Paterson, one of the directors of the Converse Rubber Shoe Co., Malden, Massachusetts, and manager of the company's Chicago sales branch, returned on August 24 from a six weeks' vacation in Scotland.

The Steam Bag Corporation, 1545 Broadway, Denver, Colorado, has been incorporated in that state, with a factory at 1222 Elati street, Denver, to manufacture the "20th Century Steam Curing Bag" for vulcanizing tires. The company holds patents on the device covering the United States, Canada, Great Britain, France, and Germany.

R. L. DeVoe has been appointed Chicago branch manager of the Madison Tire & Rubber Co., New York City, with headquarters at 1606 South Michigan avenue.

The Hunter Dry Kiln Co., Indianapolis, Indiana, has just completed a plant addition of brick and steel construction, approximately 105 by 85 feet, especially designed for the manufacture of its latest improved dryer. This device is made entirely of metal with the exception of its insulation, and because of its simplicity of construction and operation is in demand for export as well as for domestic trade. The company is also adding to its facilities for manufacturing the metal racks and trays which are used with this dryer.

The Strongcord Tire & Rubber Manufacturing Co., Evansville, Indiana, has increased its capital stock from \$250,000 to \$1,250,000. R. G. Schultheis is secretary, and the offices and sales rooms are at 413-414 Mercantile Bank Building.

The Federal Rubber Co. of Illinois, Cudahy, Wisconsin, which had planned a \$1,000,000 factory addition, to be six stories and basement, has postponed building until next year, on account of present conditions and the difficulty in getting delivery of steel before winter. It is expected that building operations will begin in the early spring, contingent on conditions at that time.

The plant of the Kansas City Tire & Rubber Corporation, Kansas City, Kansas, placed in the hands of receivers on May 24, 1919, has been leased to the A. J. Stephens Rubber Co. of the same city, which has also purchased all the liquid assets of the company. The plant is being operated on full time, manufacturing tires and inner tubes, and the Stephens company plans soon to add two night shifts in order to run 24 hours daily. The company also manufactures accessories and fabric products, some of which have been described in recent issues of THE INDIA RUBBER WORLD.

G. E. Bovis has been transferred to Chicago to represent The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, succeeding H. G. Couturier, transferred.

Resolutions against the compulsory adoption of the metric system were passed by the Society of Automotive Engineers at the recent business session held at Ottawa Beach, Michigan.

The Century Rubber Works, Chicago, Illinois, which some time ago effected the sale of its plant to the Zeglen Tire & Rubber Co., Inc., 118 North La Salle street, in the same city, for the purpose of manufacturing tires, has built a larger plant for its own use, into which it expects to move at an early date.

THE RUBBER TRADE ON THE PACIFIC COAST.

By Our Regular Correspondent.

ALTHOUGH STILL HANDICAPPED with a shortage of skilled labor and slow deliveries of needed machinery and supplies from the East and Mid-West, the rubber manufacturers on the Pacific Coast are making good progress in overtaking unfilled orders. All report general business conditions good and are cheerful about the outlook for the remainder of 1920. Efforts are being made continually to facilitate direct shipments of plantation rubber, and there is some talk of forming a manufacturers' purchasing agency to take over the business hitherto done largely by import brokers. Something may develop along this line in the near future.

Rubber mills which have been supplying tread stock to tire repair men on the coast were much relieved by the easing up of the gasoline shortage. During the two months of "gas" scarcity the bottom fairly fell out of the tread stock trade, as automobile owners, being unable to use their machines, deferred repair work until they could get more use of their cars.

The Western Rubber & Supply Co., 1011 South Olive street, Los Angeles, has been appointed southern California and Arizona distributor of Gillette chilled-rubber tires and tubes.

Many southwestern dealers in solid rubber tires intend to have exhibits at the tractor show (said to be the only one to be held in the United States this year) September 20-26 at Glendale, a suburb of Los Angeles.

In accordance with its new country-wide policy, the Miller Rubber Co., Akron, Ohio, through its subsidiary, the Miller Rubber Co. of California, has taken over the direct distribution of Miller tires throughout southern California. J. O. Ward is branch manager.

Distribution of the products of the Columbia Tire & Rubber Co., Columbianna, Ohio, will be made in California and Arizona by the Lichtenberger-Ferguson Co., of Los Angeles, and San Francisco, a leather firm which took up rubber goods a few years ago.

LOS ANGELES NOTES.

The Garlock Packing Co., Palmyra, New York, has opened a branch office in the Higgins Building, N. Main and Second street, Los Angeles, in charge of Frederick A. Griffith, son of the vice-president of the Garlock Co. An extensive stock of rubber and asbestos specialties will be carried at the new southwestern distributing station.

The Auto Tire Manufacturers and Jobbers' Association has been recently formed by tire men for the purpose of correcting the abuses prevalent in the tire trade of Los Angeles. Frank T. Price is president and Alfred E. Adams, secretary. The other officers and directors are: J. R. Campbell, Roy R. Meads, Frank Osler, W. A. Rix, Adolf Schleicher, A. J. Straney, L. S. Utter, and J. B. Wood. The offices are at 903-904 Broadway Central Building, 424 South Broadway, Los Angeles.

A. Roy Knabenshue, of Los Angeles, California, has obtained the exclusive agency for Lehigh tires and tubes in southern California.

A native of Ohio, where he was born in 1876, Mr. Knabenshue has had a varied business career in the East, West and Middle West as a telephone engineer, designer of automobile accessories, balloonist, pilot and builder of dirigibles and manufacturer of inner tubes. In 1916 he obtained an order from the Air Service for a special spherical balloon and twenty-five observation balloons. He then organized the Knabenshue Manufacturing Co. and leased a factory at Northport, Long Island, where this government contract was completed. In 1919 he purchased the factory and equipped it for making Knabe inner tubes, which business he sold out in February in order to return to California.

Dr. Wayland A. Morrison has been chosen as consulting surgeon for The Goodyear Tire & Rubber Co., of California, Los Angeles, and will assist Dr. Louis D. Chaney, chief of the staff of the hospital which the company maintains in its factory.

The Holland-American steamship line will begin regular sailings this Fall via the Panama Canal between Los Angeles harbor and Boulogne, Rotterdam, and Plymouth. The trip from Los Angeles to the first port of call in Europe, Plymouth, will take thirty-five days. Ample accommodations, it is said, will be provided for freight and passengers.

J. Elden Shaw has been appointed Pacific Coast manager for the Standard Four Tire Co., Keokuk, Iowa, with headquarters at the Los Angeles branch, of which he will also have charge. Mr. Shaw was formerly sales manager of The Savage Tire Sales Co., San Diego, California.

Owing to the demand for Grow tires in the West and the railroad situation, the George Grow Tire Co. of Boston will erect another factory at Los Angeles, California. Four representatives of the firm are now on the Pacific Coast, prepared to negotiate for a site for the new plant.

SAN FRANCISCO NOTES.

C. E. Cook, head of the mechanical goods sales department of The B. F. Goodrich Co., Akron, Ohio, has been a guest of W. T. Powell, San Francisco district manager. Mr. Cook opened and conducted the San Francisco branch until he was called to a higher position in Akron.

The Eastern Manufacturers' Co., 312 Clay street, San Francisco, has been appointed Pacific Coast distributors of the Parco inner tires made by the Pan-American Rubber Co., Milwaukee, Wisconsin.

The Kern County Cotton Growers' Association, the first to be formed in central California, was organized August 8, at a meeting of cotton growers in Bakersfield, in which the office will be located. Picking prices at 2½ cents a pound for the short and 4½ cents for the long-staple cotton were decided upon. Kern county has 10,000 acres planted to cotton, this being the second season; and about 15,000 acres are planted to cotton in other San Joaquin Valley counties.

Jesse J. Hawkins has resigned his position as manager of the rubber footwear department of the San Francisco branch of the United States Rubber Co. to take charge of the rubber footwear department of the wholesale house of Cahn, Nickelsburg & Co., San Francisco. He was transferred to San Francisco two years ago to take charge of the C. R. Winslow branch of the United States Rubber Co., which was recently consolidated with the San Francisco branch.

SOUTHWESTERN NOTES.

Fully 15,000 acres of long-staple cotton, largely contracted for long in advance by makers of rubber tires, are under cultivation in Imperial Valley, California, and the crop prospects are excellent. The entire valley lies wholly below sea level and is irrigated by a canal from the Colorado river. The valley cities of Calexico, Brawley, and El Centro have experienced a remarkable boom, as evidenced by the census returns showing growths of 681, 512 and 239 per cent., respectively, in the past ten years. The prospects are for a greatly increased acreage in cotton next year, with prices well sustained.

Ground has been broken at Downey, California, by the West Coast Asbestos Co., a subsidiary of the E. M. Smith Co., Los Angeles, for a factory in which will be made a large variety of rubber-asbestos articles. On the tract of nine acres bought by the company a first mill unit will be erected, measuring 100 by 400 feet, half of which will be two stories high. This building, with machinery for crushing, spinning and weaving asbestos for brake linings, clutch facings, packing, etc., will mean an expenditure of \$250,000, it is stated. Heavy oil and fire

hose will be a specialty of the new concern, which will employ 150 men at the start.

A project for developing eighty sections in the Pecos Valley, Texas, for sulphur is being launched by a Los Angeles concern known as the Consolidated Sulphur Co., of which E. Barner, of Pecos, Texas, is the local representative. It is claimed that large deposits of sulphur, rivalling in extent those in Louisiana, exist in the Pecos Valley and that mining can be carried on at a small cost.

The Coahuila Rubber Co., a Detroit concern, has an experiment station, near San Jacinto in Southern California, devoted to raising guayule. The guayule plants are about half matured and, it is said, quite as satisfactorily as any similar growths below the Mexican border. The resident manager is J. G. Evans.

The United States Rubber Co., New York City, has promoted G. W. Manchester, formerly branch manager at Kansas City, to the position of district manager at Dallas, Texas, succeeding W. F. Gordon, resigned.

NORTHWESTERN NOTES.

James E. Haab, formerly factory representative of The Rubber Products Co., Barberton, Ohio, has been promoted, in charge of sales in the northwest district.

The Puritan Rubber Co., Inc., 16-17 Wilson Building, Yakima, Washington, has begun the construction of a \$500,000 tire and rubber factory to manufacture "Pathfinder" tires and tubes, and mechanical rubber goods. The officers are: F. C. Plouf, president and treasurer; L. W. Hobson, vice-president; and O. P. McElmeel, secretary.

The Occidental Rubber Co., Everett, Washington, has finally started its tire factory, after much delay due to slow deliveries of machinery; and it expects within a few weeks to be running well into quantity production.

The Western Diatomite Co., Lumber Exchange building, Portland, Oregon, of which J. W. Ganong is president, is having a warehouse built at its mines at Terrebonne to hold 20,000 sacks or 30 carloads of the white siliceous mineral powder which it sells in large quantities to manufacturers of insulation material. From another large mine at Harper, also in Oregon, a considerable and increasing amount of diatomaceous earth is supplied to many rubber mills.

THE TIRE IN-SOLE.

The "Mile Multiplier" is the name bestowed upon the new tire in-sole, a heavy, crescent-shaped, endless cushion of tough resilient rubber, with breaker strip on its outer surface, which is said to neutralize the conflicting forces that work destruction on a tire. It is made thick on the center and graduated down to a feather edge. No special preparation is required for its use—it is inserted between the casing and inner tube. It is covered by a guarantee against punctures, and prevents blow outs. It is claimed to outlast the life of several tires. (Tire In-Sole Manufacturing Co., Findlay, Ohio.)

THE "VULPA" TUBE AND PATCH.

"Vulpa" is the name given to the extra heavy red inner tubes manufactured by a New York firm, and likewise to its self-vulcanizing patch for inner tubes. This patch is applied to the repair in the usual way, and it is claimed that vulcanization takes place through the frictional heat of the running car. It is also claimed that the Vulpa patch will repair a cut of any size in a tube, and can likewise be used as emergency repair for blow-outs and cuts in casings, as well as for other rubber articles. (W. E. Spencer Co., 1 Park Place, New York City.)

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

(820.) An exporter inquires for the name and address of the manufacturer of "Samson" rubber soles.

(821.) Request is made by a rubber company for the addresses of concerns who could utilize used tire casings in car-load lots.

(822.) A rubber manufacturer asks for the address of a company manufacturing a machine for sifting compounding ingredients.

(823.) Inquiry is made for the address of the manufacturer of a machine for inflating toy balloons.

(824.) A foreign correspondent asks for the name of the American manufacturer of derivatives of furfural, as furfuramide and furfuraniline used as accelerators, and also desires to know the American names of these chemicals.

(825.) A subscriber requests the address of the manufacturer of the Diamond wire wrapper for winding hose with wire.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet, and state number.

DISTRICT OFFICES.

New York: 734 Customhouse.
Boston: 1801 Customhouse.
Chicago: 504 Federal Building.
St. Louis: 402 Third National Bank Building.
New Orleans: 1020 Hibernia Bank Building.
San Francisco: 307 Customhouse.
Seattle: 848 Henry Building.

COOPERATIVE OFFICES.

Cleveland: Chamber of Commerce.
Cincinnati: Chamber of Commerce;
General Freight Agent, Southern Railway, 96 Ingalls Building.
Los Angeles: Chamber of Commerce.
Philadelphia: Chamber of Commerce.
Portland, Oregon: Chamber of Commerce.
Dayton, Ohio: Dayton Chamber of Commerce.

(33,377.) A merchant in Norway desires to secure an agency for the sale of dress shields. Quote c. i. f. Norwegian port. Payment through banks.

(33,378.) A commercial agent in Canada desires to secure an agency for the sale of fountain pens. Quote f. o. b. American ports. Payments cash against documents.

(33,383.) A banking institution in Czechoslovakia desires to purchase 200 tons of asbestos for immediate shipment. Subsequent orders to amount to 400 tons annually. Quote c. i. f. European port. Payment cash in United States currency. Correspondence in Czechic, German or French.

(33,391.) A commission agent in Poland desires to secure an agency for the sale of rubber goods.

(33,411.) A commercial agent in Poland desires to secure an agency for the sale of balata belting, and rubber goods and packings. Correspondence may be in English.

(33,423.) A commercial agent in Cuba desires to represent manufacturers on a commission basis for the sale of tires.

(33,495.) Tenders are now being received by the chief of the fire department of a city in Canada for fire hose.

(33,506.) A firm in Argentina desires to secure an agency for the sale of rubbers used for motor cars. Correspondence may be in English.

(33,526.) A merchant firm in France desires to secure an agency from manufacturers for the sale of pneumatic tires. Correspondence should be in French.

(33,531.) A commercial agent in Austria desires to secure the representation of firms for the sale of American goods, including rubber manufactures, in that country.

(33,498.) A firm of merchants in Hungary desires to purchase rubber and asbestos goods.

(33,452.) An American exporter representing large European concerns, and who has connections in South America and other parts of the world, desires to secure representation for the sale of tires.

(33,550.) A firm of importers in India desires to be placed in communication with manufacturers and dealers in rubber-stamp-making machines and appliances.

(33,554.) An agency association in the Netherlands desires to get in touch with manufacturers who are not yet represented in that country, with a view to securing exclusive agencies for the sale of rubber hose for technical purposes.

(33,557.) A firm in Belgium desires to secure the general representation for the sale of tires for bicycles, motor cycles, automobiles and trucks; also automobile accessories.

MISCELLANEOUS FOREIGN NOTES.

TYPKE & KING, LIMITED, Mitcham Common, Surrey, chemical manufacturers, is represented in Manchester by W. Harrison & Co., Limited, 14 Market Place, where J. G. Thurston, a director of the company, gives personal attention to inquiries from the rubber trade. The previous agency arrangement with Louis Minton, Trevelyan Buildings, Corporation street, Manchester, were terminated last April and the new agency connection became effective May 1 last.

The Society of Motor Manufacturers and Traders will hold its next motor exhibition towards the end of the year at the White City and Olympia. It is expected to be the largest display of motors ever held, not only in England, but on the Continent and in the United States as well.

A joint committee of British and American authorities has proposed to limit the weight of golf balls to 1.62 ounces, and the minimum diameter to 1.62 inches. The recommendations will come up for final consideration in September.

Milledge Brothers, Melbourne, Australia, will act as agents in Victoria for Mason tires. This territory includes the city of Melbourne and a number of important towns in southeastern Australia.

Muggli & Rieser, 93 Bahnhofstrasse, Zurich, Switzerland, have undertaken the sales of Mason tires and tubes in that country and expect to introduce them into Germany as soon as such imports are allowed by the German Government.

Rubber manufactures valued at \$211,653 were shipped to South Australia during 1917-18, compared with \$286,412 in 1916-17. There was also a decrease in asbestos packing, \$11,110 in 1916-17 as against \$8,973 in 1917-18. The export trade of South Australia suffered an even more serious decline from that of the previous year than did the import trade.

The Swedish importing concern, known as A. B. Orion Rubber Import Co., has voted to increase its capital from 150,000 to 300,000 kroner by issuing 1,500 shares at par.

The Askim Rubber Co. has been established at Askim, Norway, to manufacture rubber shoes and automobile tires. The capital stock amounts to 1,000,000 kroner, entirely paid in.

THE STRIKES AND LABOR TROUBLES IN THE RUBBER MILLS OF CLERMONT-FERRAND, France, have been settled. The plant of Etablissements Bergougnan is operating to full capacity and has been little affected by the recent labor troubles under which French industry has been suffering. The plant is somewhat behind on orders, as it has been since the signing of the armistice, and the Italian plant of the firm and the Bergougnan Rubber Corporation of Trenton, New Jersey, are helping to fill foreign orders.

ON THE LIST OF GOODS WHICH, ACCORDING TO LATEST INFORMATION, can be exported from Italy only under license, appear carnauba wax, ceresine, crude rubber and gutta percha, and reclaimed and waste rubber, including worn out rubber articles.

The Rubber Trade in Great Britain.

By Our Regular Correspondent.

THE PEACHEY VULCANIZATION PROCESS.

ON JULY 7, at the Grand Hotel, Manchester, Louis Minton gave a luncheon to a number of representatives of the rubber manufacturing and allied industries to meet S. J. Peachey, who it was announced would give a description of his new vulcanization process. The chairman proposing Mr. Peachey's health said he thought the gathering was unique in the annals of the British rubber trade and suggested that an organization somewhat on the lines of The Rubber Association of America would prove of interest and importance. He had no financial interest at all in the new process, but having had from the trade many inquiries concerning it he had conceived the idea of inviting Mr. Peachey to make any explanations he thought fit.

Mr. Peachey, in rising to respond, said that he did not propose to give an account of his process, as he presumed it was sufficiently well known by that time to the practical men he saw before him, and he would therefore merely adopt the rôle of answering criticisms, constructive or destructive as the case might be, on his process, which he wished to state emphatically is not a "stunt."

Prominent among those who took advantage of the opportunity to learn more about the process and its potential applications were J. K. Burbidge of Warne & Co., Limited, Tottenham; F. J. S. Gray, of St. Helen's Cable & Rubber Co., Limited; A. E. Salmon, of Chess & Stead, Limited; and Mr. Gibson, of Turner Bros. Asbestos Co., Limited.

The points raised related largely to the manufacture and application of the two gases and to the application of the process to molded goods, such as buffers. Rubber cable insulation, asbestos jointing and waterproof textures also came up for discussion. Naturally at this stage of affairs the patentee is not ready with cut and dried details of procedure with regard to the large and diverse number of goods which the rubber manufacturer produces and he did not hesitate to say so. In some cases which had special mention he said that experimental work was in progress and he was not at the moment prepared to say anything by way of elucidation. With regard to pneumatic tires the present position, Mr. Peachey said, is that the process is not applicable. It is clear that there will have to be special mechanical appliances for building up, this being a matter for development in the future. With regard to the production of buffers, a point on which considerable discussion took place, the patentee was persistently optimistic as to the results which might be expected by building up in layers to be jointed by the new solution process, quite a moderate cold pressure being all that would be required.

Asked as to the formation of sulphuric acid through the process, Mr. Peachey said that he had not noticed it, but a weak ammonia treatment would be effective against it. As to the action of sulphur dioxide in certain fillers, he had not made any experiments, but in his ordinary procedure the hydrogen sulphide was always in excess, which meant that no free sulphur dioxide could occur in vulcanized goods.

With regard to the gases, the sulphur dioxide would be purchased by rubber manufacturers, though the hydrogen sulphide would probably have to be made on the premises and he agreed with one of the speakers that a permit would probably have to be obtained from a Government department. He thought that the toxicity of this gas had been exaggerated; indeed, he ventured to say that in small quantities it was an appetite improver and a dietetic. Plans for the necessary plant are now being prepared by important rubber engineers who have expressed themselves as confident of overcoming any initial difficulties.

Questioned on the point of the water produced in the chemical reaction between the two gases, Mr. Peachey said he had not

found this to cause any trouble; it was produced in a very finely divided state and soon diffused out of the rubber, or could be removed by drying the rubber for an hour or so at, say, 35 degrees C. He had ideas of a mold made of some porous material for molded goods, but so far had nothing in that direction to report. With regard to compounded goods, Mr. Peachey said that pure rubber is more difficult to cure than compounded rubber, the gases penetrating more quickly in the latter case.

On the motion of J. Brierley, of the Leyland & Birmingham Rubber Co., Limited, seconded by H. W. Hatton, of the Premier Waterproof & Rubber Co., Limited, and supported by F. J. S. Gray, of St. Helens Cable & Rubber Co., Limited, a cordial vote of thanks was accorded by the guests to Mr. Minton for his hospitality.

THE WATERPROOF GARMENT TRADE.

Considering the extremely wet weather which has prevailed during the whole of July the continued stagnation in the weather-proof garment trade and the consequent accumulation of stocks has come as a surprise. People in the rubber proofed garment trade, however, say that wet weather does not usually bring an access of business, their experience being that potential purchasers say that the old coat is good enough for dirty weather and that they usually put off their new purchase until the fair weather that follows in the wake of the foul. By the way the weather is behaving this summer, it rather looks as if the purchase would be put off until the Greek Kalends, but we trust that there will be a turn for the better before long.

Although the making-up trade is by no means busy, the proofing works do not report any slackness, though foreign demand is quiet owing to what are considered excessive prices. The raincoat trade is in a poor way and makers are saddled with large stocks they do not know what to do with. This has come about chiefly on account of the cloth, a large amount of goods having been made entirely of cotton instead of the woolen or union gaberdine which used to be almost universally used and which were really some protection against rain, whereas the cotton article is of very little use. At the present time, however, the old-time gaberdine costs 25 shillings per yard and there is only a limited sale for coats made of it.

RUBBER MACHINERY STOCKS IN DEMAND.

New issues of capital have not been so frequent of late as they were some months back, but Francis Shaw & Co., Limited, has had a successful issue and the same may be said of Vickers, Limited, which, at one time an armament firm alone, is now closely concerned with the rubber industry.

Among recent developments in this line is the manufacture of rubber machinery at the Barrow works and the production of waterproof cloth at the Dartford works, Kent. These works were at first the home of the Clark tire of Australia and have been utilized more recently by Messrs. Vickers for war work.

EXCESS PROFITS DUTY.

A good deal has been said about the Excess Profits Duty now confirmed at 60 per cent for the current year being responsible for the slackness in trade which is apparent in many quarters, but it is much open to doubt as to the degree of influence which this tax has exerted. An interesting point of detail about deduction allowed in computing the profits of private limited companies is the distinction made between the original partner directors who are the real capitalists and other directors, generally heads of departments, who hold a few shares and who have been given the status of directors for certain reasons. The Chancellor of the Exchequer distinguishes the latter by the term employee-directors, which to my mind is a good idea and a useful distinc-

tion, albeit it may not be entirely to the liking of those concerned. Concessions which have been made to small new business will be appreciated by many in the rubber trade, and as for the large old-established concerns we shall probably find that despite their lamentations they will continue to present satisfactory balance sheets.

RUBBER EXPERTS IN STORES DEPARTMENTS.

I have been struck with an advertisement by the London County Council for an assistant in the stores department who understands the chemistry and manufacture of rubber. Candidates are to come direct from the rubber trade and their principal work will be concerned with the purchase and supply of rubber goods. I imagine this to be quite a new departure, the usual procedure being that all sorts of stores are bought by one individual of no technical knowledge who may or may not seek the assistance of a chemist who acts in an entirely subordinate capacity. It has long been in my mind that stores superintendents would be well advised to seek technical advice when arranging contracts for various articles, though I had not imagined the appointment of a whole-time expert for one particular branch of goods.

THE HOT WATER BOTTLE JUDGMENT AGAIN.

In an important assize trial in which many thousands of pounds were involved and which was concerned with the Sale of Goods Act, the writer was interested to hear counsel quote extracts from the hot-water-bottle judgment. In this case, which went to the High Court a few years ago, it was held that the seller of a hot-water bottle gave an implied warranty that the hot water would remain in the bottle and not go into the bed. The case had nothing to do with the rubber, but it appears that the judgment in the water-bottle case is quoted as an important one in its general bearings.

PNEUMATIC TIRES OF CHAR-A-BANCS.

The impending increase in railway fares will drive more travelers on to the road, but there can be little doubt that the monster char-a-bancs in which the so-called poor man spends so much time careering about the country will raise their fares in sympathy. These huge conveyances, which take up the whole of most of our narrower roads and are a constant source of annoyance to owners of private cars, are at present limited in their speed to 12 or 14 miles per hour. It is confidently anticipated, however, that the solid tires at present used will be replaced before long by pneumatics with the result of an increased rate of speed.

MAGNESIA.

An article entitled "Light and Calcined Magnesia" in *THE INDIA RUBBER WORLD* for July, is not wholly clear. Magnesia, as used in the rubber trade, is carbonate, heavy and light, and calcined, heavy and light. The scientific explanations given are right enough if read as applying to light and heavy and not to light and calcined. In Britain the bulk of the carbonate of magnesia used is the light, which, although of the same chemical composition as the heavy, both being hydroxycarbonates, occupies a far larger volume per unit of weight. This, as the writer of the paragraph points out, has nothing to do with specific gravity, but is concerned with occluded air. Where the magnesia is made by the wet chemical process by precipitating a magnesium salt with sodium carbonate the use of hot concentrated solutions gives a precipitate of heavy magnesia, while cold dilute solutions give the light variety. This being much more bulky requires far more space for production and subsequent drying. In a general way it may be taken that a certain weight of light and heavy magnesia, either carbonate or calcined, will occupy five times as much space for the light as for the heavy. The great bulk of the commercial magnesia used in the British rubber trade is not made by the old precipitation process but by the treatment of dolomite (the double carbonate of lime and magnesia) with carbonic acid gas under pressure. The magnesia goes into solution

as the bicarbonate and is obtained on evaporation in the very lightest form and made over quite free from sulphates.

UNITED RUBBER PRODUCTS CO.

The United Rubber Products Co., which I mentioned in my last correspondence as having acquired the works of G. W. Laughton & Co., Limited, of Croft street, Clayton, Manchester, to work a recent process for the utilization of waste rubber, has come in for some animadversions in "Truth" of July 21. Personally I know nothing of the recent process, so cannot form an opinion as to its value, but it seems to have been too readily assumed that the process is one for reclaiming rubber, which is, of course, as critics have pointed out, by no means a novelty. If it is merely a reclaiming process the literature of the company might be revised with advantage, but it does not indicate that a new reclaiming process is valueless, though most of those which have reached the Patent Office files seem to die of inanition shortly after.

THE RUBBER INDUSTRY IN BELGIUM.

Special Correspondence.

THE COLONIAL EXPOSITION AT ANTWERP.

IT CAN BE SAID that when M. Franck, the Belgian Minister of Colonies, asked the Comité des Fêtes d'Anvers, 1920, to include in its program a colonial exposition, he chose the right time. For, apart from the educational value of an exposition of the vast natural resources of the Congo, it has the higher purpose



HALL OF THE ANTWERP COLONIAL EXPOSITION.

of showing to the thousands of foreigners gathered together at Antwerp from the four corners of the earth, that the horrors of the war and four long years of enemy occupation have not weakened the national spirit of enterprise.

Some of the names connected with the promotion of this exposition will sound familiar to many American rubber men. There is M. Edouard Bungé, head of the Société Anonyme Bungé, Antwerp, and the indefatigable president of the executive committee of the exposition. Lieutenant-Colonel Leon Osterrieth, director-general of the present exhibition and director of many a successful exposition in the past, it will be remembered, was military attaché at Washington during the war. Of the secretaries on the committee, Emile Hendrickx will be recalled as having accompanied Colonel Osterrieth during his stay in America.

The arrangement and appearance of the 40 booths are a credit to all concerned. As might have been expected, rubber and rubber men were very much in evidence. Among the concerns of interest to Americans in the rubber trade, the following were represented: L'Association des Planteurs de Caoutchouc,

Osterrieth & Co., Société Anonyme Bungé, Willaert Frères, G. & C. Kreglinger, Compagnie du Kasai, Grisar & Co., "Belgica" Comptoir Colonial; the last-named company has been particularly active in the planting of *Hevea* in the Congo and has plantations which have entered the productive period.

Of the exhibits, one of the most interesting certainly was a case of samples of *Hevea* from the plantations in the Congo run by the State and by the two companies that have persevered in planting *Hevea*, namely, the Ferminière and the Belgica. The samples are said to be of excellent quality and were quoted in Antwerp at as high as 14-15 francs per kilo. It is further stated that in spite of doubting spirits, *Hevea* in the Congo is succeeding. The root disease from which the young trees suffered at first has been stopped and the trees are big yielders of excellent rubber. Many of the 7- to 8-year-old trees are said to have circumferences of over a meter (39.37 inches).

The annual production of plantation rubber in the Congo is estimated to be around 500 tons. And by the way, the estimated output of wild rubber for 1920 is 2,500,000 kilos. In 1917 the yield was 2,659,000 kilos.

All strength to the little country that put up such a brave fight during the great war, and is with equal pluck making strenuous efforts to win its way back to prosperity.

COMPAGNIE BERGOUNGAN BELGE.

The Société Générale des Etablissements Bergougnan, whose headquarters are at Clermont-Ferrand, France, has just established a branch in Belgium known as the Compagnie Bergougnan Belge. Its object is the commerce and industry of rubber and other gums, rubbered fabrics, chemical and industrial products for the manufacture of rubber and other gums, and of all that is connected with that branch of the industry; further, it will manufacture and sell all articles of metal or other substances that are related to the cycle, automobile and general vehicle industry. The capital of 20,000,000 francs is represented by 40,000 shares of 500 francs each, and 20,000 founders' shares.

The first directors are: Raymond Bergougnan, Etienne Clementel, Jean Bergougnan, Albert Galicier, Adrien Josse, Baron Edouard Empain, François Empain, Georges Theunis and Albert Mary.

BELGIUM'S COMMERCIAL REVIVAL.

That Belgium is picking up rapidly is abundantly apparent, and really all the trumps are with her; the sympathy of the world; a rich colony to develop and a thrifty, hard-working population; no Near Eastern question to bother about; no road to India to guard; being such a small country and having suffered so much in the war, she is not expected to take up undesirable burdens and to interfere when she would rather not.

Consequently she is able to concentrate all her efforts on regaining her former prosperity, and statistics show that she is on the highway to success. It is held that of all the European countries, Belgium's condition is the soundest. During the first quarter of 1919, Belgium had an unfavorable trade balance of over 91 per cent; the first three months of this year showed that the adverse balance had been cut to 42.1 per cent.

Her shipping is also picking up; since the war 24 steamship companies have been established in Antwerp; of these 10 have a total capital of 211,500,000 francs. The other 14 each have a capital of less than one million francs.

RESTORING THE ELASTICITY OF RUBBER.

Rubber articles that have become hard recover elasticity if soaked in three per cent carbolic water or three per cent aniline solution. In carbolic water black goods become gray. If it is desired to preserve the black or red color of the goods, that can be done by using a one per cent solution of pentasulphide of potash. This smells unpleasant, but the restoration of elasticity is quite considerable.

THE RUBBER INDUSTRY IN AUSTRIA.

By a Special Correspondent.

MEN closely connected with the conditions in the Austrian rubber industry are inclined to be more hopeful about the economic future of Austria. It seems that the Austrian rubber manufacturers have been able to collect a fairly efficient labor force and will endeavor to specialize in the manufacture of high-class rubber goods requiring special skill for their production. For this kind of work Austria seems to be well equipped and as high prices can be obtained today for practically all articles requiring a large percentage of labor there is hope that Austria may be remunerated for her efforts. Among the principal obstacles to the development of the Austrian rubber industry at the present moment are the frequent internal political crises which are interrupting the slow progress of reconstruction which is being carried out with great energy by the manufacturers.

NOTES FROM GERMANY.

A somewhat peculiar experience is that of the German rubber sole industry. During the war rubber and substitute soles were much in demand. This enthusiasm for rubber footwear has continued all through the first year after the war. Now there is suddenly a falling off in the demand. The manufacturers thought that the decline in orders was due only to the general depression of the market, but it appears now that the German public is not so interested in rubber soles and heels as formerly. Great efforts have been made to retain the business, but notwithstanding, fewer rubber soles are sold and the demand for leather soles increases. Two reasons are given for this occurrence. The first is the comparatively low price of leather following the recent readjustment of hide prices and the second the poor quality of most of the rubber soles manufactured at the present time by the German manufacturers. A contributing cause which is of minor importance is the disinclination of the rubber goods dealers to sell rubber soles in competition with other retailers, such as dry goods stores, etc. The sale of rubber goods is still specialized in Germany and there are quite a number of goods stores dealing in nothing else but rubber articles. These stores are looking askance upon the wholesale distribution of rubber heels and in some cases have refused to handle the goods of factories dealing with other retailers.

The manufacturers of sporting shoes with rubber soles report a heavy decline in orders, due principally to the high prices still ruling. The fact is that the German public has regained its usual understanding of the value of money and is not inclined to spend as recklessly as a few months ago. This naturally has an effect upon the distribution of high-priced goods, and where four months ago any price would have been paid, today the customer will leave the shop and think twice before purchasing.

The Central Union of Surgical Rubber Goods Dealers is firing a broadside at the Commissioner of Imports and Exports against the recent regulation which forces exporters to quote in foreign money units. It seems that the necessity of quoting in foreign money has led to a considerable reduction in foreign orders for German merchandise and that other difficulties have resulted from the regulation. It is, for instance, practically impossible for any German merchant to draw a perfect balance as he never knows how he stands with reference to his foreign credits. The Surgical Rubber Goods Dealers are of the opinion that it should be left to the exporter to say whether he wants to quote in German or foreign money.

The same association has also raised a protest against the recent law imposing a duty of ten per cent on all exports.

GERMAN CRUDE RUBBER MARKET.

A market for crude rubber has been established in Hamburg and rubber importers are again able to quote German prices, subject, however, to frequent changes. The following are the prices ruling the first week of July: crêpe, finest light, 33 marks per kilogram; first latex crêpe, thick, 33 marks; prime smoked

sheets, 33 marks; hard cured fine Pará, 37.50 marks; Peruvian, 32 marks; block balata, Venezuela, 66 marks; reclaimed rubber, American, gray, 23 marks; white, 22 marks; black, 16 marks.

Much interesting information about conditions in the German rubber industry is contained in the recent report of the Kölnische Gummifaeden Fabrik of Cologne. This firm is engaged principally in the manufacture of elastic bands. With the help of small quantities of rubber obtained from governmental stocks in the beginning of 1919, the works started again, being closed for several years. Later larger supplies of rubber were obtained from England and deliveries have been regular ever since so that the factory is now working at full capacity. While rubber is obtainable at fair prices, there are great difficulties in the deliveries of supplementary materials such as solvents, cotton fabrics and fuel, most of which still have to be imported. With the resumption of international trading relations the factory has been able to obtain good orders, although prices have fluctuated heavily under the influence of the changing foreign money values. An increase of the share capital of this company from 1,080,000 marks to 3,000,000 marks is proposed.

FINANCIAL AND TRADE NOTES.

The Asbest und Gummi Werke Alfred Calmon Aktiengesellschaft of Hamburg has increased its share capital from 4,000,000 marks to 10,000,000 marks.

The Deutsche Linoleum Werke, Hansa, in Delmenhorst, has increased its share capital from 3,400,000 marks to 4,800,000 marks.

Owing to the difficulty of obtaining regular supplies of coal several large industrial enterprises in Germany have recently acquired their own coal mines. Among others, the Continental Caoutchouc & Gutta Percha Co., Hanover, has asked the shareholders for authorization to buy a coal mine in Westphalia.

The Norddeutsche Gummi und Guttapercha Waren-Fabrik, formerly Fonrobert & Reimann Aktiengesellschaft, in Berlin, has increased its capital from 1,500,000 marks to 3,000,000 marks.

C. Mueller Gummiwaren Fabrik, Aktiengesellschaft, Berlin-Weissensee, has increased its capital from 1,100,000 marks to 2,200,000 marks.

The Bremer Gummiwerke Roland A. G., located at Bremen, has changed its name to Bremer Gummiwerke Roland Aktiengesellschaft. The company has decided to increase its capital from 1,200,000 marks to 2,000,000 marks.

Erich Bonwitt, 68 Chaussee street, Berlin-Britz, is a wholesale distributor of rubber, old rubber, and other similar articles.

NEWS OF THE GERMAN CABLE INDUSTRY.

THE German cable industry, which is one of the most active branches of the German electrical industry, passed through a rather difficult time during the war. As an export industry of considerable importance it severely felt being cut off from foreign markets, and for a while at least, the directors of the cable manufacturing companies were inclined to take a rather serious view of the situation. An improvement took place during the beginning of 1915 when army orders began to pour in, with the result that the industry was soon occupied upon government work almost entirely, a condition that has continued up to the end of the war.

The German cable industry relies for its rubber material entirely upon foreign supplies, and it made only very small use of reclaimed rubber manufactured in German factories before the war. In fact, most of the reclaimed rubber used by the larger German works was of either English or American origin. New rubber was soon practically unobtainable owing to the British blockade, and the electrical industry therefore was compelled to fall back upon substitutes of various characters. Old material was used wherever possible, and a great many other materials were tried with little appreciation, however, from the engineers. So the acquisition of rubber is one of the principal problems of

the German cable industry at the present time. The question has been thoroughly ventilated in German technical journals and associations, and it is generally expected that Germany will not have difficulty in securing the necessary rubber at competitive prices, provided always that the allies do not make true their threat of the Paris Conference, to cut off Germany from the raw material supplies or to supply raw materials to Germany at higher cost than those sold to their own industries. To-day rubber is purchased in small quantities by the German cable industries in London and by way of the Netherlands. Also limited quantities of reclaimed rubber have reached the cable works by way of the famous "hole in the West," the territory now under occupation by the allies which forms a large opening for the introduction of many articles of allied origin.

The high prices that have to be paid for rubber and reclaimed rubber introduced in this manner, have raised the prices of cables very much and there is in fact at the present moment no standard price in Germany for any article, manufactured from imported raw materials. Wages in the cable industry have risen very rapidly since the armistice was concluded and are now, on the basis of international exchange value, approximately three times what they were before the war, and with no prospect for firm rates until a stabilization of the exchange rate of the mark has been effected. The eight-hour day, of course, is an accomplished fact in all cable works, and this, in addition to the very much decreased efficiency of the labor force, has acted to reduce materially the production. There are no special statistics available for the conditions in the cable industry. It has been shown, however, that the average reduction of efficiency of the labor force comprises about five-eighths of the former working performance per employee.

To help maintain prices on a profitable level and to assist individual manufacturers in the purchase of raw materials, especially rubber, it has become necessary to continue the Verband Deutscher Stark Strom Kabel Fabrikanten, which now includes all the cable works of importance, as the formation of associations of this character has been supported by the Government during the war.

The German cable industry is expected to be very busy during the next year. Germany is now executing a very far-reaching program of national electrical power development which is principally based upon power production at specially suitable centres, and the transmission of the power generated in this manner to the points of consumption by way of high tension cables. As some of these giant generating stations will be situated in the Rhineland and power will have to be transmitted as far as Berlin, large cables will be required for that purpose. The German plan of power generation contemplates also the erection of power stations on several hydro-electric sites with the provision that these stations, of which some are already in operation, will be linked up with the large coal-fed generating stations, each supporting the other. This will require also very powerful cables for the exchange of power between the different stations.

This work alone will provide occupation for the cable works of Germany during the next few years. But additional work is provided further by the necessity of renewing the under-sea cables that have either been destroyed by the Allies or taken over as the result of the peace agreement. The renewal of the German international cable lines is at present one of Germany's most difficult modern problems. Everybody in Germany seems to agree that the nation should own its own cable lines in the future. But so far nobody is able to say who shall pay for the new installation and how it will be possible to secure the necessary terminals, as these have been taken over, together with the cables, by the Allies. The cable works, however, are confident that a solution of the problem will be found and that new cables necessary to Germany's renaissance will have to be made by the works.

DEATH OF THREE PROMINENT GERMAN RUBBER MEN.

The "Gummi-Zeitung" announces the death of three men prominent in the German rubber industry. Ch. C. Bohning, director of the Bremer Gummiwerke Roland A. G., died in Bremen, Germany, on July 4, 1920. Before entering the above firm Mr. Bohning was director of the Grottau Section of the Vereinigte Berlin Frankfurt Gummiwaren fabriken.

Dr. Hugo Cassirer died in Charlottenburg, near Berlin, on the eighth of July, at the age of fifty-one years. He was the founder of Dr. Cassirer and Co., and of the Lincas Gummiwaren fabrik, G. m. b. H.

Karl Reithoffer, a member of the well-known firm of the Gummi- und Kabelwerke Josef Reithoffer's Soehne, Vienna Stepr-Trensen, died in Vienna, on June 22, 1920, following an operation for appendicitis. He was born in 1870. The firm of Josef Reithoffer's Soehne is said to be the oldest rubber works in the world, having been founded in 1811 by J. N. Reithoffer, for the manufacture of rubber thread to be used in elastic woven goods.

TARIFF NOTES.

AUSTRALIA.

AMONG RECENT ADDITIONS to the list of articles that may be admitted into Australia free of import duty under special license for use in the manufacturing of other commodities are machines for applying rubber internal wire tires to wheels, and machines for close-jointing rubber internal wire tires after application to wheels.

INCREASE OF CUSTOMS DUTIES IN BELGIUM.

By a Belgian law dated June 10, 1920, the government was authorized to apply to the specific rates of duty laid down in the Customs Tariff "coefficients of increase," which were not to exceed three in any case. This law was followed by a royal decree dated June 12. The decree became effective on June 21 and will continue in force until June 15, 1921. The coefficient of increase does not apply to *ad valorem* duties. The coefficient of increase is the figure by which the normal tariff must be multiplied to obtain the new rate of duty.

Equivalents.—France, about 19 cents (normal); kilo, 2.2 pounds.		Duty in		Coefficient of Increase.
Tariff No.		Francs.		
10.	India rubber:			
	Raw		Free	..
	Rubber tires:			
	Solid tires	100 kilos	65.00	2
	Pneumatic tires:			
	Casings for automobiles and motorcycles:			
	With studded leather band.....	100 kilos	130.00	2
	Other	100 kilos	116.00	2
	Casings for other vehicles weighing each—			
	Less than 600 grammes.....	100 kilos	90.00	2
	600 grammes or over.....	100 kilos	60.00	2
	(Treads, protectors, etc., composed mainly of rubber, are to be treated as complete corners.)			
	Inner tubes:			
	For automobiles and motorcycles.....	100 kilos	170.00	2
	For other vehicles.....	100 kilos	150.00	2
	Other manufactures of rubber.....	ad val.	10%	..
33.	Rubber belting	100 kilos	30.00	2
54.	Manufactures of asbestos combined or not with rubber (packing), tubes and pipes of rubber, rubber tubes for artificial flowers.....	ad val.	5%	..
64.	Elastic tissues mixed with cotton silk, etc., cotton predominating	100 kilos	320.00	3

Note.—Rubbered textile fabrics specially manufactured for making cord fillets are free of duty. However, imports of these fabrics can only take place through the custom houses designated for the purpose, and subject to the importers proving to the satisfaction of the customs that the fabrics are really intended for the above-mentioned purpose.

DENMARK.

By a decree of the Royal Danish Government of June 29, 1920, the restrictions on the exportation of rubber tires and rubber tubes for motor vehicles have been removed.

GERMANY.

According to the "Deutsche Allgemeine Zeitung," Germany, with the object of regulating its foreign trade, has had recourse to the *ad valorem* system of duties on exports. The duty on all kinds of rubber and rubber goods is two per cent of the value,

which varies according to their quality and importance to Germany.

MEXICO.

The Mexican "Diario Oficial," issue of June 30, 1920, contains the changes in the Mexican schedule of import duties which went into effect July 1, 1920. Of special importance are the reductions in duty on rubberized cloth and waterproof clothing, shown in the following comparative table (the normal value of the Mexican peso is \$0.4985; a kilo is 2.2046 pounds):

Item No.	Article.	New Duty, Pesos per Kilo.	Old Duty, Pesos per Kilo.
703A.	Ready-made clothing of rubberized cloth..legal weight	.60	4.00
712.	Rubberized cloth of cotton, same duty as cotton cloth of same grade.....	...	(*)
712A.	Rubberized cloth of linen, hemp, and similar fibers, wool, or silk, dutiable at 50 per cent of the rate on corresponding cloth.....	...	(*)

*Former classification uncertain.

The original decree provided for the doubling of the duty on rubber tires for automobiles and trucks. This change, however, was abrogated by the decree of July 12 and the former rates are now in effect.

CONDITIONS IN FRENCH INDO-CHINA.

Special Correspondence.

THE ECONOMIC CONDITION of Indo-China has never been so good as it is at present. The country has progressed, industries are growing, the country's products, among which are rice, pepper, minerals and rubber, are in great demand and the rate of exchange of the piaster, the local coin unit, is high. Altogether there is extraordinary prosperity in this French colony.

In the face of all this it comes as a shock to read in the April number of the "Bulletin du Syndicat des Planteurs de Caoutchouc de l'Indochine," telegrams in which the necessity of a much-reduced rate of exchange is urged if the plantation industries in this country are not to be ruined.

The piaster, a silver coin, had before the war a value of approximately 2.50 francs. At the present time, however, the rate has reached the abnormal figure of 14.50 francs, giving the piaster, which normally is equal to about half an American dollar, a value greater than that of the dollar. The plantation industries, except rice, are suffering severely, for the high value of the piaster makes their products, rubber particularly, two and three times as expensive to produce as the like products from Malaya or the Netherlands East Indies.

As a remedy, the Chamber of Agriculture, Chamber of Commerce and the local Rubber Planters' Association have addressed a letter to the new Governor General, M. Maurice Long, suggesting means of improving the situation. It seems that there is a great shortage of rice throughout the East. Indo-China has a bumper rice crop and can export to the value of 225,000,000 piasters. It is now suggested to levy an export tax of three per cent of the rice, the funds thus obtained to be used to aid agriculturists, rubber planters, etc.

THE RUBBER MARKET AT MARSEILLES.

Letters between a Parisian rubber broker and the President of the Colonial Institute at Marseilles have been published in a recent issue of the "Bulletin des Planteurs de Caoutchouc de l'Indochine," and reveal certain conditions existing in the Marseilles rubber market that are not only detrimental to rubber planters in Indo-China, but will prove a disadvantage to Marseilles as a port of entry for rubber.

The Parisian broker declares that when making tare allowances the local importers from Indo-China give the weight authorized by the sworn weighers. The weighers, however, do not weigh each case in a lot, but give an average weight based on the actual weight of, say 10 per cent of the cases. As this

average is generally too low, this method of procedure spells loss to the purchaser. Another point is this:—rubber from this colony is of an irregular quality and is appraised below corresponding grades of Malayan or Ceylon rubber. Now, it happens that many importers of the Indo-Chinese rubber, considering their mark sufficiently well-known, refuse to take samples from lots offered for sale and offer only samples taken from former lots. This, in combination with the pretty bad reputation of Indo-China rubber, forces an importer, who begins by demanding a price based on the rate for Malayan rubber quoted in London, to sell his goods at a price very much below the London rate and often below the actual value of his rubber.

IMPORTS AND EXPORTS.

According to a recent issue of the "*Bulletin Economique de l'Indochine*," France sent to this colony during the year 1918, rubber goods—chiefly tires—to the value of 1,305,000 francs and weighing 687 quintals (220.46 pounds) against a value of 1,233,000 francs and a weight of 649 quintals during 1917, the figures for 1918 showing an increase in value of 72,000 francs.

From other countries the imports were as follows:—boots and shoes of rubber: 391 quintals, value 313,100 francs in 1918 and 139 quintals, value 111,100 francs in 1917; elastic fabrics: 55 quintals, value 136,800 francs in 1918 against 31 quintals, value 72,200 francs in the previous year. Belting, hose and packing also showed an increase for 1918, the figures being 421 quintals, value 378,800 francs, as compared with 205 quintals, value 184,700 francs during 1917. The most important increase was tires and tubes, the 1918 imports being 403 quintals, value 766,000 francs against only 75 quintals, value 142,500 francs in 1917. Here the difference in favor of 1918 is 623,500 francs. That Japan's share in all this business is considered important, although the amounts are 186 quintals, value 226,000 francs, is seen from the fact that the imports from that country are the only ones to be specially mentioned. The exports of crude rubber follows:

	France. Kilos.	Other Countries. Kilos.	Totals. Kilos.	Total Values. Francs.
1913	168,700	45,200	213,900	.....
1914	146,000	48,000	194,000	876,000
1915	376,100	600	376,700	1,695,000
1916	547,800	700	548,500	3,292,000
1917	930,800	.....	930,800	5,585,000
1918	537,700	.....	537,700	3,226,000

The drop in exports during 1918 was more than made up for during 1919, when total exports of rubber amounted to 3,518,969 kilos. Of this 2,834,853 kilos of plantation rubber went to France; 7,084 kilos to London; 32,816 kilos to Hongkong; 939 kilos to San Francisco; 354,106 kilos to Shanghai; 259,822 kilos to Singapore. Besides this 29,349 kilos of wild rubber were shipped to Marseilles.

THE RUBBER TRADE OF INDIA.

BURMA.

RUBBER is fast becoming one of Burma's principal exports; 4,149,000 pounds being shipped in the fiscal year 1918-19 as against 2,634,000 pounds in 1917-18, and 2,301,000 pounds in 1916-17. Most of these shipments went to the United Kingdom. Rubber goods to the value of \$6,505; \$18,538; and \$11,292 were imported from the United States to Burma during the fiscal years 1917, 1918 and 1919 respectively. The decrease in 1919 was due chiefly to import and export restrictions. Declared exports of india rubber from Rangoon to the United States in 1918 totalled 4,480 pounds valued \$2,777; in 1919, 112,215 pounds valued \$57,142.

There are 500 mills or factories in Burma, which offer a possible market for rubber belting. Though the British are said to control the greater part of this business, competition from American manufacturers is beginning to be felt. The imports of

rubber, balata, and fabric belting were, in 1918-1919, £76,600 compared with £38,000 in 1914-1915.

In the hope of restoring the rubber industry in Burma, the Government has decided to advance 100 rupees at 6½ per cent interest for every acre planted with rubber. During the first six months of 1919, Burma's largest ten plantations produced 1,142,383 pounds of rubber. Exports in the same period amounted to 2,206,527 pounds, valued at \$836,052.

CALCUTTA.

Rubber articles to the value of \$1,565,216 were imported at the port of Calcutta during 1917-18. The following year, 1918-19, shows a slight increase in value, the amount totaling \$1,586,529. Raw rubber exported from Calcutta in 1917-18 amounted to \$2,024, while in 1918-19 the amount decreased to \$1,864.

SOUTH AMERICAN NOTES.

PERU.

MANUFACTURERS of rubber to the value of \$241,398 were imported into Peru in 1918 as against \$162,923 in 1917. Exports of crude rubber from Peru in 1917 were: Condurango, \$91,836; crude, \$2,812,640; during 1918, Condurango \$47,497; crude \$1,573,646. Declared exports of rubber to the United States from Callao during 1917 were 3,760 pounds of Condurango, valued \$375 and 8,568 pounds of raw rubber valued \$4,435. From Mollendo 705,684 pounds of rubber valued \$393,536 were exported to the United States in 1917, while in 1918 the amount decreased to 25,112 pounds valued \$12,066.

NICARAGUA.

Exports of crude rubber from Nicaragua amounted to \$258,852 in 1917 as against \$42,619 in 1918. This decrease was due to the restrictions placed upon this product and the decline of the market. Declared exports of rubber from Corinto to the United States in 1917 were 224,429 pounds valued \$107,158; in 1918, 77,000 pounds valued \$25,479.

PIRELLI BUYS JAVAN ESTATE

It is reported that on June 10, 1920, the Rubber & Tea Estate Boesi Sari Lendra, covering about 2,100 acres, and planted for the greater part, was sold for about \$540,000 to Pirelli & Co., Milan, Italy, manufacturers of tires, rubber goods, insulated wire, etc. The estate is situated about 30 miles from Garoet, Java.

The Italian company acted through Dr. Luigi Sarcoli, a doctor of chemistry, who will establish himself in Java and act as estate manager. He, together with Alfredo Calcagni, also connected with the Pirelli factory, arrived in Java with a staff of 30 employees.

The estate will now be operated exclusively for supplying raw material to the plant in Milan.

Buying up more estates was at first considered, but owing to difficulties with foreign exchange, nothing appears to have come of this yet.

ALGERIA RUBBER IMPORTS.

Rubber goods were imported into Algeria in larger quantity in 1919 than in 1918, the totals being 421 metric tons valued at \$1,846,624 in 1918 as against 610 metric tons valued at \$2,731,143 in 1919. The quantity of imports of rubber and gutta percha goods from the United States in kilos (1 kilo equals 2.2046 pounds) for the year 1919 is given provisionally in the table below:

Fountain pens	Kilos	318
Shoes .....	.....	37
Tires .....	.....	16,400
Other rubber manufactures .....	.....	300

The Rubber Trade in Japan.

By Our Regular Correspondent.

THE JAPANESE RUBBER INDUSTRY.

IT WAS about thirty-four years ago that the Japanese rubber industry started. N. Tasaki, owner of the Tsuchiya Rubber Works, which later became the Mitatsuchi Rubber Manufacturing Co., was the first man in Japan to learn the process of rubber vulcanization. Since then Japanese rubber manufacturing has made considerable progress. Some manufacturers learned their methods from foreign engineers, some from books on rubber manufacturing, and thus more than thirty years have passed. At present there are 130 factories in Tokio.

A general survey of the rubber factories in Japan indicates that all divide themselves into five heads:

1. The Mitatsuchi Rubber Manufacturing Co. line.
2. The Meiji Rubber Factory line.
3. The Rubber Co. line.
4. The Dunlop and the Ingram line.
5. Other lines.

The Tsuchiya Rubber Works, afterward the Mitatsuchi Rubber Manufacturing Co., was established thirty-four years ago at Kamiyoshi-cho, Asakusa, Tokio. Messrs. T. Tasaki and H. Tsuchiya were the owners of this factory. They were of the Matsumae clan, Hokkaido, and fishing and refloating wrecked ships, by using diving apparatus and rubber hose, was their occupation. Their equipment required frequent repairs, especially the rubber parts. In order to mend these they purchased at Yokohama scrap rubber discarded by the Navy Office, dissolved it in volatile oil and made a jelly-like material with which the damaged parts were plastered.

As their fishery did not prosper, they established a factory at Kamiyoshicho, Asakusa, Tokio, for manufacturing diving dresses. This factory was the first one in Japan. In those days these diving dresses were sold only to the railway and steamship companies, so that the demand was soon exhausted. Then they undertook to become repairers of these dresses, also manufacturing stamp-stands for the Department of Communication.

It was about 1882 or 1883 that rubber became known a little among the Japanese people, but owing to the deficiency of manufacturing knowledge and experience, the rubber industry in Japan was still in its infancy. As no other rubber factory had been established in Japan in those days, the Tsuchiya Rubber Co. held a monopoly. Owing to the limited demand for their goods, however, it suffered from financial difficulties, yet bravely continued the business until a method of vulcanization was learned on December 2, 1886; this day it was decided to incorporate. In 1889 bulbs and packings were added to the list of goods and in the following year some rubber manufactures were exhibited at the Domestic Industrial Exhibition. The factory was removed to Narihira-cho Honjo, in the same city in 1892, and in 1893 the company became a partnership and the name was changed to the Mitatsuchi Rubber Manufacturing Co. Besides former productions, manufacture of ebonite and suction hose was now begun. During the Chino-Japanese war, they profitably met the requirements of the War and Navy Offices. Since then the rubber manufacturing industry in Japan has made constant progress. In 1897, rubber balls were manufactured, and in three years enough were produced so that the imports of foreign-made balls became unnecessary. In those days, rubber balls were mainly imported from Germany, the total amount being \$120,000 a year. At present, a great number of them are exported.

The company now known as the Fujikura Insulated Wire & Cable Co., Tokio, was a pioneer in the production of rubber-covered wire. The progressive policy of Mr. Fujikura, who founded the industry in 1885, has been continued since his death, in 1902, by T. Matsumoto, the present president of the company.

The concern adheres closely to the standards of the British Cable Makers' Association and the Japanese Government to insure the maximum of efficiency in the products.

Much of the success of the company is also due to Kenzo Okada, nephew of the late Mr. Fujikura, who became a partner in the factory in 1901. He will be remembered by not a few rubber men in the United States where he worked for several years acquiring a knowledge of the industry.

In 1887, K. Yoshida, getting a water bottle of rubber from abroad, endeavored to manufacture this line of rubber goods, and at last, with the assistance of F. Komae and his brother, R. Yoshida, who were then students of the Doshisha University in Kyoto and had many chances of reading foreign books on rubber, worked out a manufacturing method. By 1889, there were but few factories in Japan. K. Suzuki, who learned the method of making rubber solution in naphtha, began to manufacture stamp-stands, with the capital furnished by S. Nomoto; but unfortunately his undertaking did not go well. Mr. Mori also in these days inaugurated a shop with a view of making rubber seals.

The Tokio Rubber Manufacturing Co., a limited partnership, was established in 1892. G. Matsumoto and S. Morita were the capitalists. They engaged Mr. Saito as an expert and were doing a brisk business when the engineer died and the factory had to suspend. In 1896 this company was purchased by K. Kamijo and the firm name was changed to the Tokio Rubber Factory, K. Kamada being engaged as engineer.

In 1901 G. Yonei, who died last year, bought this factory and changed the name of the company to the Meiji Rubber Factory. This is one of the oldest and largest rubber factories in Japan.

The Tokio Rubber Co. was established in 1899, H. Tanaka induced S. Nomoto, Z. Fujikura and E. Shibusawa to assist the company, and engaged Mr. Ogihara, an engineer educated in America, with the object of manufacturing rubber goods. Unfortunately the goods were not successful and therefore they bought over Mr. Arihara, of the Mitatsuchi Rubber Manufacturing Co., to manufacture "Tabi" soles; but this second attempt also did not bear good fruit.

A few years later Messrs. Y. Yashida and Hanaki, who were then employed by the Meiji Rubber Factory, purchased the Tokyo Rubber Co. and reduced its capital from \$150,000 to \$75,000.

The Nippon Rubber Co. was established in 1900 by the combination of two companies, with W. Yamasaki as director. One was the Yashida Rubber Factory, which had been established at Hisakata-cho, Tokio, by the cooperation of Messrs. S. Yoshida and W. Yamasaki in 1896; the other, the Nippon Rubber Co., established at Hashibacho, Asakusa, in 1900, R. Motohashi being the director.

In 1900, the Meiji Rubber Factory engaged Mr. Ferguson, an Englishman. In those days there was no factory which kept a foreign expert.

This new attempt gave a little animation to the Japanese rubber manufacturing industry, but a large development was still far in the distance. The following figures show the amount of the business in those days:

CRUDE RUBBER IMPORTS.

Year.	Pounds.	Value.
1900	107,439	\$52,179
1911	154,924	68,332

A little after the Russo-Japanese War, the Dunlop Rubber Co., Far East, Limited, was organized in 1907. At first it imported rubber goods from the Dunlop company in England and the

Ingram Co. in America; but a few years later, a factory was established at Kobe for the manufacture of bicycle tires.

The Japan Ingram Co. was established by the son of Arthur Ingram, with the object of making rubber goods.

NEW RUBBER CORPORATIONS IN JAPAN.

The following corporations were established in Japan during 1919:

Kyodo Rubber Co., Limited. Capital, \$500,000, one-fourth paid in. Office, at Sugamo, Tokyo.

Miyakawa & Co. This shop was formerly operated by Mr. Miyakawa, but was incorporated owing to the increase of business.

Hinomaru Wire Rubber Co., Limited. Capital, \$500,000. Office in Osaka.

Americo-Japanese Rubber Industry Co., Limited. Capital, \$500,000, one-fourth paid in. Office, Yurakucho, Tokyo.

Towa Rubber Co., Limited. Capital, \$100,000, one-fourth paid in.

Godo Rubber Industry Co., Limited. Capital, \$100,000, one-fourth paid in. This company is to manufacture cycle tires, tubes and other rubber goods. Office at Minamisenju, Tokyo.

Hinode Rubber Co. Capital, \$15,000. Office at Shitaya, Tokyo.

Nikkwa Rubber Industry Co. Capital, \$5,000.

Rubber Balloon Manufacturing Factory. Capital, \$250,000. Office at Osaki, Tokyo.

Tokio Rubber Co., Limited. Capital, \$1,250,000. Office at Ochiai, Tokyo.

Yamato Rubber Industry Co., Limited. Capital, \$250,000, one-fourth paid in. Office at Kameido, Tokyo.

Koyama Rubber Commerce and Industry Co., Limited. Capital, \$50,000, all paid in. Office at Kanda, Tokyo.

Osaka Tabi Sole Co., Limited. Capital, \$250,000. Office in Osaka.

Daiichi Rubber Factory. Office at Kameido, Tokyo.

Nippon Ebonite Co. Office at Mikawashima, Tokyo.

Hokoku Rubber Co., Limited. Capital, \$500,000, one-fourth paid in. Office in Osaka.

Osaka Rubber Sole Tabi Manufacturing Co. Capital, \$12,000. Office in Osaka.

Izumo Rubber Works. Capital, \$15,000. Office at Kitashinagawa, Tokyo.

Nichifuku Rubber Manufacturing Factory. Office in Tokyo.

Yukita Rubber Industry Co., Limited. Capital, \$75,000, one-fourth paid in. Office in Saitama Prefecture.

Imperial Cycle Co., Limited. Office in Tokyo.

Fukushima System Rubber Shoe Co., Limited. Capital, \$100,000, one-fourth paid in. Office at Nihonbashi, Tokyo.

Central Rubber Industry Co., Limited. Capital, \$1,000,000, one-fourth paid in. Office in Tokyo.

JAPANESE NOTES.

FROM all accounts it seems that Japan is endeavoring to dominate trade in the East. That she is succeeding to a certain extent is acknowledged, and among the growing exports may be noted rubber goods. Japan is also trying to maintain her position in shipping, but the English have recovered their prestige quicker than Japan thought possible, and America is a competitor to be reckoned with. In spite of this, the large steamship companies entertain extensive plans for the future, including improvements in the harbor of Tokio.

JAPAN AND THE NETHERLAND EAST INDIES.

Japan is particularly friendly with the Netherland East Indies. The "Dutch East Indian Archipelago" announces that "the Japanese squadron has been cordially received at Macassar and other ports in the Archipelago. Officers and crews were regaled everywhere." It is not a one-sided affair, for "reports about the

hearty welcome extended to the Dutch squadron in Japan have been received here with great satisfaction." Also, the "South Sea Association" at Tokio has decided to hold an exhibition of produce and manufactures of the Netherland East Indies. The Dutch authorities at various points in Japan are cooperating heartily. Among the principal exhibits, rubber, of course, takes an important place. A final quotation from the above publication follows here: "The Japanese Government has again invited some prominent Dutch gentlemen to visit Japan. The visit will probably take place in 1921."

JAPAN'S IMPORTS.

Japan's imports of crude rubber in 1919 exceeded 24,000,000 pounds, an increase of 48 per cent over 1918. Domestic manufactures include automobile and bicycle tires, rubber cloths, and mechanical and industrial rubber goods. Imports of rubber manufactures were chiefly waste or old rubber, woven belts, hose, plates, sheets, tubes, waterproof sheeting, insulating tape, insulated wire, threads, strips, bands, rings, washers, rods, and cords. The imports of dental rubber alone amounted to \$85,000. Japan's rubber manufacturers have received large orders from Siberia.

THE RUBBER INDUSTRY IN CEYLON.

Special Correspondence.

MUCH SPACE in local publications is being devoted to the question of a Ceylon planters' union. Opinion is fairly unanimous as regards the need for some change in the conditions of the planters, but there is quite a lot of more or less intemperate argument about the need of a union. The more conservative minds think that the existing Ceylon Planters' Association is fully capable of meeting the needs of all the planters, particularly if it were reorganized. However, a great number of planters, probably influenced by the success of planters' unions in Java and Sumatra and of the Incorporated Society of Federated Malay States Planters, desire a separate association.

From the mass of correspondence on the subject it appears that among the sympathizers with the idea of a union there is a very strong objection to the name union. Opposers of the entire scheme are afraid of Bolshevism. A few believe that the present salaries would be adequate if rates of exchange were normal and will be sufficient once normal progress reduces the cost of living all around, and therefore suggest a temporary bonus to help the planters over the abnormal period. That this last suggestion is entirely impossible from the planters' point of view, is evident from their demands, which include increases of pay; home leave with full pay plus passage money at the end of a fixed period of service; sick leave, and pensions.

Prior to the present union scheme, an estate superintendents' association had been organized and was widely supported. Fortunately for the success of the newer scheme, the superintendents' association has now been amalgamated with it.

COUNCIL REFORM.

At the Ceylon Association dinner given recently in London to the Governor of Ceylon, who is on a visit to England, the Governor declared that he would urge that the mercantile community should again have representation in the legislative council and also in his own privy council. The Ceylonese should have a greater voice in the government of Ceylon.

EXPORT DUTY ON RUBBER.

At a recent meeting of the legislative council of Ceylon the question was asked whether the Government when preparing the budget for 1920-21, would consider the possibility of reducing, if not withdrawing entirely, the export duties on tea and rubber imposed during the war to provide funds for carry-

ing on the works usually debited to loan account. No relief was promised.

CEYLON DURING 1919.

During 1919 conditions were more favorable for rubber, though the high rate of freight and the abnormal exchange rate were serious factors in the cost of production. The price for the first grades of plantation rubber fluctuated considerably, falling from 2s. 2d. in January, to 1s. 7d. in June to rise again to 2s. 11d. at the end of the year.

Reports from Ceylon show no serious increase of pests or diseases during the year 1919, though brown bast had been giving trouble on some of the older estates.

The budget for 1920-21 disclosing that not only is the excess profit tax to be retained but is to be increased to 60 per cent, has caused considerable disappointment here.

GENERAL NOTES.

The present freight rate of rubber from Ceylon to the United Kingdom is 165 shillings.

The General Rubber Co. will shortly be moving into new premises above the Eastern Bank, Limited, in Chatham street, Ceylon.

It is reported that a Badulla planter has left Ceylon for North Borneo to open 200 square miles of rubber, 5,000 acres at a time.

It appears that the Holland-America Steamship Co. proposes to begin a service of freight boats from Europe to the East with an extension to America. Colombo will be a port of call.

The new Dixon line is to run regularly from Colombo. It is understood that Messrs. Struthers and Dixon will establish a branch executive office at Singapore, better to handle the ports in the neighborhood.

The Ellerman & Bucknall Steamship Co., Limited, is starting a regular monthly service from Montreal to Port Said, the Soudan, Aden, Bombay, Colombo, Singapore and Java.

THE RUBBER INDUSTRY IN MALAYA.

Special Correspondence.

THE OUTLOOK for rubber is fully occupying everybody's attention. The general opinion seems to be that conditions are favorable enough and that all would be well were it not for the labor problem. Others look at the large new planted areas and talk of overproduction and a slump in the market, while many take comfort in the huge amounts of rubber used in America, in the increasing use of motor-driven vehicles and the consequent demand for tires of every kind, and have no fear of the future. Those who talk of overproduction are told that diseases are carrying off great numbers of trees and that all that is planted is not destined to produce. Not a very consoling answer, whatever the implication may have been.

THE AMERICAN BUGABOO REVIVED.

Some years ago there was a great outcry here from a certain section of the planting community against the American invasion of rubber lands. That bugaboo was eventually buried when the Rubber Lands Enactment was enforced. However, it has appeared again in new form and stalks about in the guise of American financiers who are gambling with rubber. At all events, a letter in the "Malayan Tire & Rubber Journal," May 31, 1920, signed by "Help Yourself," expresses astonishment at the rubber growers of Malaya, Ceylon, Java and Sumatra who are allowing American buyers to control the price of rubber. He, too, believes in a rubber shortage; also is apparently anxious that the price of rubber should be correspondingly high, and suggests a combination of rubber growers of the Mid-East to control the output and the price of rubber.

RUBBER PRICES.

The "Straits Times," May 27, says in an editorial: "From a source which on many occasions we have found most reliable,

we learn that there is a quiet movement on foot to take advantage of the present low prices of rubber and to buy up control of the local companies. The big manufacturing interests are said to be at the back of the movement, and the reason given is that, in their opinion, rubber is of much greater value than the current prices would lead one to assume." As will be noted, the "Straits Times" mentions no names and talks of no manufacturing interests in general—English, American, any kind. It also counsels shareholders to hold on to their shares.

It further says: "Malaya produces nearly three-fifths of the world's total output, so that it is within the power of the Malayan companies to force prices up at any time they please." It also advises the industry to perfect its organization and to get experts to study the price question.

ALTERNATE-DAILY TAPPING.

In the life of an individual or a community there always comes a time when a panacea is looked for that will cure all the ills existing. No small section of the planting community is regarding alternate-daily tapping as such a cure-all. It will solve the labor problem, because half the number of tappers can be used; the health of the trees will be promoted, because less bark will be consumed, and some believe that it will even prevent brown bast; overproduction and consequent low prices will be prevented, because there will be a reduction in output amounting to about 40 per cent.

It must be admitted that while estate managers are eager for a solution of labor troubles, they do not like the idea of a reduced crop. Therefore, it has been suggested to combine alternate-daily tapping with the practice of doubling the length of the tapping cut, using a half spiral or basal "V" cut. Such a system would probably still help in the labor problem, but the chance of overproduction and low prices remains the same, so that this suggestion will hardly be popular. In fact, the Rubber Growers' Association has already squelched it by recommending alternate-daily tapping without increasing the length of tap.

The association states that alternate-daily tapping will eventually prove the cheapest system.

THE CHINESE PLANTERS' ASSOCIATION.

A Chinese planters' association of Malaya has been formed at Penang, somewhat on the lines of the Planters' Association of Malaya. In the past, the latter association has often been handicapped because it could reach only a certain number of managers. It is expected that now the two associations together will be able to exercise greater control over the rubber industry of Malaya and it is hoped that they will cooperate as far as possible. Particularly in view of the labor shortage and the increasing demands of estate coolies, mostly Chinese, who in some cases get as much as \$1.50 a day, it is hoped that the new association will have a beneficial effect.

MALAYAN NOTES.

It is reported that the assistant chemist of the local Department of Agriculture, S. W. Bunker, B. Sc., A. I. C., has resigned to take up a new billet with higher remuneration elsewhere. Much regret is expressed by the rubber industry of Malaya, which complains that the low salaries paid by the local government have caused seven good men to resign since 1917 and to go to such organizations as the R. G. A., the Holland-America Co., and the General Rubber Co.

The possibility of growing cotton in Malaya is receiving a good deal of attention. It has been suggested that as a catch crop for one year for rubber it would also be useful.

J. BREMNER AND A. R. COX, PARÁ, BRAZIL, HAVE FORMED A partnership under the name of Bremner & Cox, succeeding the former firms carried on by them individually as buyers and exporters of rubber and other Brazilian products, and will continue in the same business. The partnership dates from June 1, 1920.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED JULY 6, 1920.

- N**O. 1,345,406. Urethroscope. M. C. Rimmer, London, Eng.
 1,345,417. Ballonnet gage. S. Truscott, Birmingham, Ala.
 1,345,522. Demountable rim for tires. J. Walker, Canonsburg, Pa.
 1,345,533. Parachute with inflated air bag closed at top and open at bottom. J. Chytrac, Clifton Mills, W. Va.
 1,345,659. Automobile-tire rim. K. A. Beddingfield, assignor of one-half to R. D. Feagin—both of Macon, Ga.
 1,345,670. Automobile-tire rim. H. H. Green, Salt Lake City, Utah.
 1,345,777. Reinforced spring tire. H. H. Holdaway, assignor by mesne assignments to The Adams-Campbell Co., Inc.—both of Los Angeles, Cal.
 1,345,812. Resilient tire with inflatable inner tube. E. Veltung, New York City, assignor by direct and mesne assignments to Veltung Steel Tire Co., a corporation of Delaware.
 1,345,886. Rubber wedge for repair part for heels. L. Rosenfeld, New York City.
 1,345,904. Sponge-rubber article and method of making the same. J. B. Wishart, Trenton, N. J.
 1,345,987. Cushion support of layers of soft and hard rubber vulcanized together. F. W. Bocking, Rifle, Colo.
 1,345,997. Casing for pneumatic tires. F. B. Carlisle, Andover, Mass., assignor to J. M. Gilbert, New York, N. Y.
 1,345,998. Casing for pneumatic tires and process of making same. F. B. Carlisle, Andover, Mass., assignor to J. M. Gilbert, New York City.
 1,346,032. Cushion tire. J. N. Keim, Mount Holly, N. J.
 1,346,073. Valve cap for pneumatic tires. R. P. Adams, Lohrville, Iowa.
 1,346,081. Circular bead core for tires. C. J. Drope, Minneapolis, Minn.

ISSUED JULY 13, 1920.

- 1,346,113. Pneumatic tire. S. L. Church, Houston, Tex.
 1,346,176. Hot water bottle. A. R. Chambers, Winthrop, Mass.
 1,346,184. Self-filling fountain pen. T. A. Dickinson, Youngstown, O.
 1,346,336. Cushion tire. R. S. Reed, Kokomo, Ind.
 1,346,342. Garter. J. K. Seymour, assignor of one-fifth to Milo H. Stearns and one-fifth to R. W. Kauffman—both of Elyria, O.
 1,346,374. Armband or garter. A. L. Herrmann, Detroit, Mich.
 1,346,421. Hose coupling. E. A. Russell and S. P. Harriman, assignors by mesne assignments to Roth Manufacturing Co.—all of Chicago, Ill.
 1,346,422. Hose coupling. E. A. Russell and S. P. Harriman, assignors by mesne assignments to Roth Manufacturing Co.—all of Chicago, Ill.
 1,346,423. Hose coupling. E. A. Russell and S. P. Harriman, assignors by mesne assignments to Roth Manufacturing Co.—all of Chicago, Ill.
 1,346,424. Hose coupling. E. N. Roth, assignor to Roth Manufacturing Co.—both of Chicago, Ill.
 1,346,425. Hose coupling. E. N. Roth, assignor to Roth Manufacturing Co.—both of Chicago, Ill.
 1,346,448. Waterproof legging to be worn over clothing. H. W. Ewing, Columbus, O.
 1,346,468. Sectional rim for pneumatic tires. G. Rubino, Turin, Italy.
 1,346,510. Metal and rubber stopper for bottles, etc. H. P. Roberts, assignor by direct and mesne assignments to Rodik Manufacturing Co.—both of Boston, Mass. (See description elsewhere in this issue.)
 1,346,514. Vehicle tire. W. Small and J. G. Small, Paterson, N. J.
 1,346,599. Flat tire signal interposed between tube and casing. D. D. Getman, Minneapolis, Minn., and J. P. Sternhagen, Glasgow, Mont.—said Getman assignor to said Sternhagen.
 1,346,627. Auxiliary detachable tire. W. Barber, New York, N. Y., assignor to Ada S. Barber, Brooklyn, N. Y.
 1,346,632. Knitted fabric inner tube covering to embed foreign articles and reduce friction. F. S. Bennett, Philadelphia, Pa.
 1,346,653. Closure with gasket for jars, bottles and other receptacles. A. Ingram and H. Ingram, assignors to Ingrams Incorporated—all of Brooklyn, N. Y.
 1,346,654. Closure for jars, bottles and other receptacles. A. Ingram and H. Ingram, assignors to Ingrams Incorporated—all of Brooklyn, N. Y.
 1,346,683. Glove with rubber membrane vulcanized upon outer surface only of body with circular ribbed portions on inside of hand and finger surfaces to facilitate gripping objects. J. N. Reynolds, Atlantic, Iowa. (See THE INDIA RUBBER WORLD, March 1, 1920, page 365; also, this issue, page 817.)
 1,346,692. Resilient tire of alternate layers of fabric and rubber with circular cushion in center. A. Balaguer, Marianao, Havana, Cuba.
 1,346,766. Resilient tire. J. A. Prince and A. L. Gilles, Nice, France.

REISSUES.

- 14,913. Repair vulcanizer. J. C. Heintz and G. Ruf, Cleveland, Ohio. Said Ruf assignor to said Heintz. (Original No. 1,262,598, dated April 9, 1918.)

ISSUED JULY 20, 1920.

- 1,346,834. Resilient rod of rubber with core of cork granules bonded together. C. E. McManus, New York, N. Y.
 1,346,841. Removable heel lift with device for fastening in place. R. W. Padden, Kansas City, Mo.
 1,346,912. Rubber hand stamp. F. Fitman, East Kew, Victoria, Australia.
 1,346,945. Pneumatic tire. C. Drouet, Houston, Tex.
 1,346,991. Rubber ball having interior circular metallic strip held at one side of center. G. M. Tatum, Media, Pa.
 1,347,021. Horseshoe with rubber cushion. T. S. Field, Atlanta, Ga.
 1,347,029. Graining-tool. P. A. Gstalder, Pittsburgh, Pa., assignor to The Ohio Varnish Co., Cleveland, Ohio, a corporation of Ohio.
 1,347,030. Graining tool. P. A. Gstalder, Pittsburgh, Pa., assignor to The Ohio Varnish Co., Cleveland, O.
 1,347,144. Demountable rim for tires. W. J. Bruce, Sterling, Ill.

- 1,347,259. Amount certification rubber check stamp for banks. J. Derscha, Flint, Mich.
 1,347,398. Douche can, with nipple provided with rubber sleeve. F. J. O'Rourke, New York City.
 1,347,439. Soft rubber ring tire casing seal. G. H. Budd, Salt Lake City, Utah.

REISSUES.

- 14,920. Windshield cleaner. L. H. Morse and J. J. Tracy, Cleveland, O.—said Morse assignor to said Tracy. (Original No. 1,339,216, dated May 4, 1920.)

ISSUED JULY 27, 1920.

- 1,347,679. Pneumatic tire without inner tube. E. B. Brown, assignor to O. W. Fort, and H. R. Taylor—all of Los Angeles, Cal.
 1,347,775. Insulating, waterproof sole for use on boots and shoes. H. M. Burr, Middletown, and G. J. Ingraham, West Hartford, assignors to The Omo Manufacturing Co.—all of Middletown, Conn.
 1,347,800. Fountain pen. P. E. Wirt, Bloomsburg, Pa.
 1,347,847. Tire casing. H. E. Grabau, Long Island City, N. Y., and A. C. Schwartz, New York City—said Grabau assignor to said Schwartz.
 1,347,848. Tire casing fabric and method of manufacture. H. E. Grabau and A. C. Schwartz, New York City—said Grabau assignor to said Schwartz.
 1,347,864. Suspensory with rubber tubing straps. S. A. Marker, Newark, N. J.
 1,347,901. Fountain pen having device for retarding flow of ink. W. T. Fitzpatrick, Waterloo, Ia.
 1,347,950. Reinforced pneumatic tire. G. Hofmann, assignor to Hofmann-Morgan Rubber Co.—both of Chicago, Ill.
 1,347,953. Resilient tire. J. A. Horne, Newark, N. J.
 1,347,993. Articulated effigy of prehistoric animal, having outer covering of elastic material. H. M. Dawley, Chatham, N. J.
 1,348,005. Device for inserting plugs in tires. H. R. Hirst, Trenton, N. J.
 1,348,094. Life-preserver helmet. D. Del Re, Iron River, Mich. (Original application divided.)
 1,348,122. Demountable rim for tires. P. S. Larson, Beloit, Wis.
 1,348,136. Shoe with rubber and fabric welted sole. E. W. Dunbar, assignor to Aspley Rubber Co.—both of Hudson, Mass.

THE DOMINION OF CANADA.

ISSUED JULY 6, 1920.

- 201,504. Wheel with pneumatic tire having enlarged edge. W. E. Beasley, Cheddington, County of Bucks, and W. Beedie, Watford, County of Herts, coinventors—both in England.
 201,553. Resilient cushion wheel. J. W. Fowler, Grey Lynn, Auckland, New Zealand.
 201,558. Pneumatic tire. T. Gordon, Vancouver Island, B. C.
 201,578. Puncture proof, combined solid and pneumatic tire. E. T. Lampard, Detroit, Mich., U. S. A.
 201,590. Demountable split rim for tires. P. L. Munford, Birmingham, Ala., U. S. A.
 201,624. Inflatable life preserver. F. Stebbing, Chicago, Ill., U. S. A.
 201,699. Removable tire tread. The Snap-on Tread & Tire Co., assignee of J. C. Burlock—both of New York City, U. S. A.

ISSUED JULY 13, 1920.

- 201,774. Inflatable life preserver. L. Farr, El Portal, Calif., U. S. A.
 201,781. Hard rubber fountain brush. C. A. Garvey, Clayton, Missouri, U. S. A.
 201,795. Stocking supporter with chest and elastic back sections. H. Keys, Ellensburg, Wash., U. S. A.
 201,905. Lather brush with bristles set in rubber and brush-containing handle. The American Safety Razor Corp., Brooklyn, assignee of M. B. Behrman, Tompkinsville—both in New York, U. S. A.
 201,915. Running-board mat. The Essex Rubber Co., assignee of R. H. Phillips—both of Trenton, N. J., U. S. A. (See THE INDIA RUBBER WORLD, June 1, 1920, page 589.)

ISSUED JULY 20, 1920.

- 201,948. Rim for pneumatic tires. W. J. Stark, Vancouver, B. C., and S. R. Ramsey, Burbank, Wash., U. S. A., coinventors.
 202,030. Demountable rim for tires. A. Mentzer, Duluth, Minn., U. S. A.
 202,070. Rubber ear-protector. H. Hasselbeck, Mannheim, Grand Duchy of Baden, Germany.
 202,128. Resilient tire with pneumatic tube. The Veltung Steel Tire Co., assignee of E. Veltung—both of New York City, U. S. A.
 202,138. Demountable rim for tires. B. W. Brockett, assignee of W. F. Traves—both of Cleveland, O., U. S. A.
 202,139. Demountable rim for tires. B. W. Brockett, assignee of W. F. Traves—both of Cleveland, O., U. S. A.

THE UNITED KINGDOM.

ISSUED JULY 7, 1920.

- 142,440. Device for beating furs, etc., with rubber mounts under levers. A. Lebel, 89 rue Pouchet, Paris, France. (Not yet accepted.)
 142,449. Capsule or closure with rubber disk. C. Columbian, 46 avenue de la Republique, Bondy, and J. B. M. Liarsou, 27 rue du Poteau, Paris—both in France. (Not yet accepted.)
 142,467. Steering and balancing device for heavier-than-air craft, captive balloons, boats, submarines, etc. The Goodyear Tire & Rubber Co., 1144 East Market street, assignee of R. H. Upson, 219 Shawnee Path—both of Akron, Ohio, U. S. A. (Not yet accepted.)

Chemical Patents will be found on pages 800, 810. Machinery Patents on pages 814, 815.

- 142,511. Teeth-cleaning and gum-massaging appliances with rotatable thin rubber disks. R. M. Withycombe, Wyoming, McQuarrie street, Sydney, Australia. (Not yet accepted.)
- 142,617. Reinforced pneumatic tire. S. Howell, Vicarage, Maenclochog, Clynderwen, Fembreckshire.
- 142,718. Cushion wheels. A. A. Thornton, 8 Quality street, Chancery Lane, London. (Demountable Spring Tire Co., 1018 Federal Reserve Bank Building, St. Louis, Missouri, U. S. A.)
- 142,720. Brassiere with upper elastic breast-band. E. W. Pattison, 51 Deansgate Arcade, Manchester. (Treo Co., 160 Fifth avenue, New York City, U. S. A.)
- 142,731. A resilient heel pad with metal frame embedded in it. J. H. Overton, 107 Spring street, Trenton, New Jersey, U. S. A.
- 142,768. Device for keeping rain-water out of cuts in rubber trees. S. J. Hally, 23 Kings avenue, Muswell Hill, London.
- 142,774. Peaks of caps and like headwear stiffened by a compressed fabric of rubber and canvas, etc. J. F. Key, 93 Hope street, Glasgow, Scotland.

ISSUED JULY 14, 1920.

- 142,791. Metal-studded fabric and leather tire cover. Societa Fabricazione Esportazione Copertoni Imperforabili-Tirino, 1 Via Accademia, Turin, Italy, assignees of G. Parenti and V. Messina. (Not yet accepted.)
- 142,987. Head-guards with sponge-rubber pads. E. T. P. Goodyear, Colley Corner, Reigate Heath, Surrey.
- 143,129. Rubber tire with reinforced cavities closed with plugs of vulcanite, the cavities containing either air or sponge-rubber. J. Cairns, 61 Clifton Road, South Norwood, London.
- 143,135. Resilient cushion tire. Naamloze Vennootschap Octrooimaatschappij Holland Tot Exploitatie van Uitvindingen, 209 Keizersgracht, Amsterdam, Holland.

ISSUED JULY 21, 1920.

- 143,307. Reinforced tire. E. Lees, White Cross, Weymouth, Dorset, H. W. Ridsdale, Hill House, Burnham-on-Crouch, Essex, and T. H. Hirst, 3 Williams avenue, Wyke Regis, Dorset.
- 143,359. Cushion tire with soft rubber body and hard rubber base. S. Hill-Wood, Park Hall, Hayfield, Derbyshire, and W. T. Clifford-Earp, Marjoriebank, Laurel Road, Barnes, London.
- 143,408. Pneumatic tire. H. Wade, 111 Hatton Garden, London. (A. C. Cle, 164 Auburn street, Auburndale, Newton, Mass., U. S. A.)
- 143,434. Golf ball comprising a number of rubber-wound or other balls, with central weights, embedded in gutta percha, balata, or rubber, the whole being rubber-wound. A. F. Dimmock, 14 Princess Square, Harrogate, Yorkshire.
- 143,490. Fountain pen. C. Leoncini, 67 Via Ricassoli, Florence, Italy. (Not yet accepted.)

ISSUED JULY 28, 1920.

- 143,644. Reinforced inner tube. H. N. Wayne, 150 South Alexandria avenue, Los Angeles, California, U. S. A.
- 143,649. Reinforced pneumatic tire. P. Harder, 13 Nordre Frihavnsgade, Copenhagen, Denmark.
- 143,725. Hand basin of rubberized material, supported by collapsible frame. (For description see THE INDIA RUBBER WORLD, April 1, 1918, page 413.) C. J. Vieuu, 291 Eastern Parkway, Brooklyn, New York; C. Wagner, 85 Washington avenue, Grantwood, New Jersey; and A. Hornel, 6 Charles street, New York—all in U. S. A.
- 143,801. Leather rubber-lined tobacco pouches. T. H. Bull, 10 Mortimer Road, Ealing, London.
- 143,802. Douche nozzles. W. J. Mellersh-Jackson, 28 Southampton Buildings, London. (J. Rose, 729 Halsey street, Brooklyn, New York, U. S. A.)
- 143,861. Device for closing punctures in tires. R. Brunner, Islikon, Thurgau, Switzerland. (Not yet accepted.)

GERMANY.

PATENTS ISSUED, WITH DATES OF ISSUE.

- 325,522. (July 2, 1915.) Substitute for solid rubber tires. Gummiwaren fabrik Louis Peter Aktien-gesellschaft, Frankfurt-on-Main.
- 325,372. (December 1, 1918.) Heel protector made of a rubber band. Alexander Uenar, Budapest, Hungary.
- 325,373. (December 2, 1919.) Rubber heel with interchangeable walking surface. Peter Beiering, 26 Schiller Place, Bielefeld.
- 326,448. (June 11, 1916.) Inner tube with textile insert in cover. Albert Schipke, 18 Lauenburgerstrasse, Berlin-Wilmersdorf.
- 326,449. (February 6, 1920.) Cover for cycle tires. Ludwig Kleine, 22 Leopoldstrasse, Lichtenberg, and Paul Henke, 11 Kamminerstrasse, Charlottenburg.

DESIGN PATENTS ISSUED, WITH DATES OF ISSUE.

- 744,308. (May 20, 1920.) Rubber patch for shoe heels with special walking surface. Otto Roebel, 8 Neuer Graben, Dortmund.
- 744,309. (May 20, 1920.) Rubber heel patch. Otto Roebel, 8 Neuer Graben, Dortmund.
- 744,401. (May 21, 1920.) Shoe protector made from new or old rubber cuttings, or old pneumatic or solid tires. Martin Korth, 72 Von Quadtstrasse, Kölln-Dellbrück.
- 744,636. (May 21, 1920.) Hose for air pump. Franz Plath, 39 Gohliserstrasse, Dresden.
- 744,734. (June 3, 1920.) Rings cut from rubber of used automobile, motor, and cycle tires. Dr. Strauch and Paperle, Hanover-Döhren.
- 744,831. (May 12, 1920.) Leather-mounted rubber heel. Chr. Eifer, Haubersbrunn, and O. A. Schorndorf, Württemberg.
- 744,832. (May 12, 1920.) Leather-mounted rubber heel without corners. Chr. Eifer, Haubersbrunn, and O. A. Schorndorf, Württemberg.
- 745,343. (June 11, 1920.) Holder for rubber heels. Kurt Feige, 4-5 Sprengelstrasse, Berlin.
- 745,634. (June 16, 1920.) Rubber heel with space for insertion of leather insert. Willy Rothhaupt, 9 Nussbreite, Eisenben.
- 746,097. (June 18, 1920.) Rubber heel with center of hard material. Friedrich Theilmann, 54 Waldstrasse, Frankfurt-on-Main-Niederrad.
- 746,176. (June 22, 1920.) Exchangeable shoe and heel cap of rubber with metal center. Josef Vitassi, Pola Via G., Venezia Giulia.
- 746,204. (June 7, 1920.) Finger ring with rubber insert for turning book pages. Ernst Gentzen, 30 Gr. Ryugstrasse, Lübeck.
- 746,299. (June 22, 1920.) Rubber sole. Wood-Milne, Limited, London.
- 746,300. (June 22, 1920.) Rubber heel. Wood-Milne, Limited, London.

TRADE MARKS.

THE UNITED STATES.

- NO. 113,809. The word GABLE—rubber tires for motor cars and other vehicles. E. B. Killen, London, Eng.
- 115,026. Representation of a seal bearing head of a buffalo and the words TRADE MARK within white circle surrounded by a black circle containing the words VIOLET RAY SELF VULCANIZING PATCH in white letters all beneath the words BUFFALO HULL PATCH—patches for repairing inner tubes, rubber hot water bags, footwear, etc. H. R. Hoffeld, Buffalo, N. Y.
- 118,275. The word ROTARY—rubber tires and tubes. The Rotary Tire and Rubber Co., Zanesville, O.
- 118,355. Representation of a tire above the word SKIDDESE—anti-skidding rubber tires. P. Sangoff, Worcester, Mass.
- 118,930. The word PARCO—tires. The Pan-American Rubber Co., Milwaukee, Wis. (See THE INDIA RUBBER WORLD, March 1, 1920, page 366.)
- 119,233. The words JIFFY LOCK—waterproof bathing suit bags. J. D. Farkas, New York City. (See THE INDIA RUBBER WORLD, August 1, 1919, page 638.)
- 119,351. The word LONDON—shoes of leather, rubber or fabric, or combinations of these, for men, women and children. London Shoe Co., New York City.
- 120,010. The word NOVART—drawing outfits including rubber erasers. H. C. Mitchell, New York City.
- 120,436. The word SURETY—inner tubes. Surety Tire and Rubber Co., St. Louis, Mo.
- 121,683. The word GLOBESTOS—brake linings. United & Globe Rubber Co., Trenton, N. J.
- 121,795. The words LUCKY STRIKE—artificial baits of rubber, etc. The Thomson-Diggs Co., Sacramento, Cal.
- 122,743. The initials A-W in outline type within a double-bordered diamond—vulcanizers, molds, and other equipment for rubber manufacturers. The Williams Foundry and Machine Co., Akron, O.
- 123,675. Representation of scroll bearing the words WALKER'S GOLDEN WALKERITE—asbestos and rubber sheet packing. J. Walker & Co., Ltd., London, Eng.
- 123,676. The word LIFACITE—asbestos and rubber steam and hydraulic packing. J. Walker & Co., Ltd., London, Eng.
- 123,677. The words DANDY LION—asbestos and rubber steam and hydraulic packings. J. Walker & Co., Ltd., London, Eng.
- 123,748. Representation of a house made of pens, within a double circle, standing on a scroll bearing the words THE PEN HOUSE—fountain pens and stylographic pens, etc. W. J. May & Co., Ltd., East Twickenham, Eng.
- 124,086. The word DELARE—rubber, leather, canvas and balata belting, rubber and metallic hose, steam and hydraulic packing, and pneumatic tires. Delaware Electric and Supply Co., Wilmington, Del.
- 124,695. Representation of label bearing the words HEAD OF THE LAKES and within a white oval a picture of a bridge over a body of water connecting two cities—arm bands, garters and suspenders. Slonim Bros., Duluth, Minn.
- 124,827. Representation of a white-outlined black panel bearing in white the words "EVER-READY" SHAVING BRUSHES and the silhouette of a man's lathered face and his hand shaving with a safety razor—shaving brushes with bristles set in hard rubber. American Safety Razor Corp., Brooklyn, N. Y. (See THE INDIA RUBBER WORLD, March 1, 1915, page 329.)
- 126,615. The words HEL FI—rubber and fiber sheet packing. The Continental Supply Co., St. Louis, Mo.
- 127,724. The word KLEINERT's—sanitary rubber sheets, rubber dams, sanitary aprons and belts, etc. I. B. Kleinert Rubber Co., New York City.
- 127,726. Representation of a malted cross bearing the word KLEINERT suspended from a scroll bearing the words THE BEST—sanitary rubber sheets, rubber dam, sanitary aprons and belts, etc. I. B. Kleinert Rubber Co., New York City.
- 128,496. The word COMMANDER—fabric and rubber belting and diaphragms for paper mill vats and rubber hose reinforced with fabric or metal. The B. F. Goodrich Co., New York City.
- 128,948. The letter A with outline of a spade spot—hard rubber rods, sheets and tubes. American Hard Rubber Co., Hempstead, N. Y., and New York City.
- 129,677. The word BALLMATIC—pneumatic cells for filling pneumatic tires. W. H. Richards, Knoxville, Tenn.
- 130,092. The word MAGNUM—tires. The Dunlop Rubber Co., Ltd., London, Eng.
- 130,286. The word RAMBLER—inner tubes. The Ohio Rubber Co., Cincinnati, O.
- 130,481. The words LISTER-MINT—chewing gum, etc. Listerated Gum Corp., New York City.
- 130,646. The word CUEWAY—shoes of leather, rubber and fabric and combinations of these. Cuetara Bros., New York City.
- 130,873. Representation of a shield bearing two T's and the word QUALITY, beside a panel containing the words FOX DIVES REASONS, the panel serving as a base for the words TRI-TEX—bathing caps, etc. Blum Bros., Chicago, Ill.
- 130,977. Representation of a slate bearing the words BOY'S SHOPS in white letters and the face of a boy silhouetted against a white oval—suspenders, garters, armbands, belts, etc.
- 131,337. The word "SHIRLATIC" quoted—dress shields and garters. I. B. Kleinert Rubber Co., New York City.
- 131,472. The word PITCHER enclosed within a conventional outline—zinc, etc. The Eagle-Picher Lead Co., Cincinnati, O.
- 131,474. The word PITCHER enclosed within a conventional outline—chemicals and pigments for the rubber trade. The Eagle-Picher Lead Co., Cincinnati, O.
- 131,526. The words TEN-EIGHTY under the figures 1080—erasers of rubber or rubber composition. E. Faber, Brooklyn, N. Y.
- 131,580. The word SNUGS—rubber boots and shoes, rubber overshoes, and rubber-soled canvas shoes. Hood Rubber Co., Watertown, Mass.
- 131,603. Black isosceles triangle with one side horizontal across the top—brake linings. Staybestos Manufacturing Co., Philadelphia, Pa.
- 132,181. The words NU-WAY enclosed in a double-bordered diamond—dust caps for pneumatic tire valves. A. L. Just, Syracuse, N. Y.
- 132,445. The words AIR-PEDS—rubber or fiber soles and heels. Pioneer Products, Inc., New York City. (See THE INDIA RUBBER WORLD, April 1, 1920, page 434.)

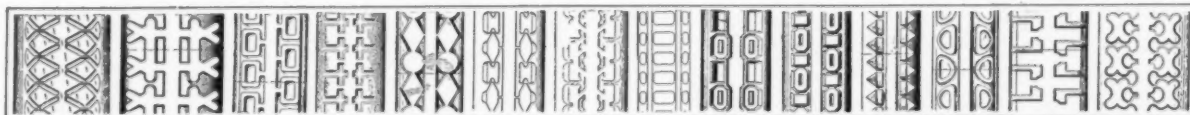
- 132,634. The word **ROLICKERS** within an oval—shoes made of leather, canvas and rubber. S. Freiburger & Bros., Fort Wayne, Ind.
 133,217. The word **SPRINGO**—suspenders. J. A. Harps, Greenfield, O.

THE UNITED KINGDOM.

- 392,896. Representation of a seal bearing the words **NEAL SON** in the center and around it the words **DANIEL NEAL & SONS, PHAT PHEET** between two concentric circles—rubber or gutta percha heel tips, pads and protectors. Daniel Neal & Sons, Limited, 68-70 Edgware Road, London, W. 2, and 124-126 Kensington High street, London, W. 8.
 392,901. Representation of a seal bearing the words **NEAL SON, DANIEL NEAL & SONS** between two concentric circles—rubber or gutta percha heel tips, pads and protectors. Daniel Neal & Sons, Limited, 68-70 Edgware Road, London, W. 2, and 124-126 Kensington High street, London, W. 8.
 396,997. The word **VENUS**—rubber nipples for nursing-bottles. J. B. Marynissen, 45 avenue de France, Antwerp, Belgium. (Address for service in the United Kingdom, care of A. W. Brown, 16 Whitehall Park Road, Gunnersbury, London, W. 4.)
 398,392. The word **SPRINT**—game balls and sporting goods. I. A. Fowler, 16 St. Nicholas street, and 73 Netherkirkgate, Aberdeen, Scotland.
 398,393. The word **NICK**—game balls and sporting goods. I. A. Fowler, 16 St. Nicholas street, and 73 Netherkirkgate, Aberdeen, Scotland.
 398,394. The word **WHIZZANG**—golf balls. I. A. Fowler, 16 St. Nicholas street, and 73 Netherkirkgate, Aberdeen, Scotland.
 398,395. The word **WASP**—footballs. I. A. Fowler, 16 St. Nicholas street, and 73 Netherkirkgate, Aberdeen, Scotland.
 398,396. The word **CHASE**—game balls and sporting goods. I. A. Fowler, 16 St. Nicholas street, and 73 Netherkirkgate, Aberdeen, Scotland.
 398,397. The word **BOUNDARY**—golf balls and sporting goods. I. A. Fowler, 16 St. Nicholas street, and 73 Netherkirkgate, Aberdeen, Scotland.
 392,498. Representation of two vertically lined diamonds on each side of the letter **G** within a wreath formed of two conventionalized leaves tied with ribbon bow—rubber tires. The B. F. Goodrich Co., 1789 Broadway, New York City, U. S. A. (Address for service in the United Kingdom, care of White, Langner, Stevens & Parry, 88-90 Chancery Lane, London, W. C. 2.)
 401,004. The word **LUXORA**—rubber and gutta percha goods not included in classes other than No. 40. Ingram Brothers, Limited, 9 Woodstock street, Oxford street, London, W. 1.
 401,651. Representation of a quill pen crossed obliquely by the words **BALLON DE POCHÉ "PLUME"**—deflatable rubber balls, included in Class 49. Etablissements Bogner & Burnet, 21-23 rue des Filles du Calvaire, Paris, France. (Address for service in the United Kingdom, care of Haseltine, Lake & Co., 28 Southampton Buildings, London, W. C. 2.)
 401,875. The word **ALTURA**—fountain and stylographic pens included in Class No. 39. A. F. Tero, 26-27 Hatton Garden, London, E. C. 1.
 401,894. The word **LEWCO**—textile-covered, rubber-insulated electric light and telephone wires. The London Electric Wire Company and Smiths, Limited, 7 Playhouse Yard, Golden Lane, London, E. C. 1.
 402,182. Representation of a 6-pointed star within a tire, giving out rays of light between the points and bearing the letter **L**, all above the word **ELINSTAR**—rubber and gutta percha goods, except tobacco pouches, not included in classes other than No. 40. F. Longdon & Co., Limited, 17 Agard street, Derby.
 402,887. Representation in black and white of a negro running with a shield and spear, above the words **THE "NIGER" STYLO**—stylographic pens. The Wylvern Fountain Pen Co., 143-144 Holborn, London, E. C. 1.
 26,541. The word **UNIVERSAL**—rubber tires, tubes, reliners, patches, tobacco pouches, invalid rings, ice bags, football bladders and accessories. Ames-Holden-McCready, Limited, Montreal, Quebec.
 26,586. The word **MAGNUM**—tires (automobile, bicycle, motorcycle and solid), rubber belting, garden hose, packing, heels and soles, golf balls and rubber cements. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ontario.
 26,587. The word **PERICLES**—tires (automobile, bicycle, motorcycle and solid), rubber belting, garden hose, packing, heels and soles, golf balls and rubber cements. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ontario.
 26,730. Representation of a fanciful figure showing a globe encircled by stars and a triple circular border, together with the words: "THE MANHATTAN RUBBER MANUFACTURING CO., PASSAIC, N. J."—belting, hose, packing and tires. The Manhattan Rubber Co., Passaic, N. J., U. S. A.
 26,747. Representation of a man wearing a helmet intended to represent the Shakespearean character Pericles, Prince of Tyre, and the words: "PERICLES, PRINCE OF TYRE, SHAKESPEARE"—tires. The Dunlop Rubber Co., Limited, Dunlop House, 1 Albany street, London, N. W. 1, England.

DESIGNS.**THE UNITED STATES.**

- N**O. 55,585. Tire. Patented July 6, 1920. Term 7 years. G. E. Batcheller, Forest Hills, N. Y.
 55,586. Tire casing. Patented July 6, 1920. Term 14 years. R. D. Belden, Marion, O.
 55,588. Tire tread. Patented July 6, 1920. Term 3½ years. W. O. Bruess, Port Clinton, O.
 55,600. Tire. Patented July 6, 1920. Term 14 years. T. Follen, La Fayette, Ind.
 55,606. Tire. Patented July 6, 1920. Term 14 years. C. W. Green, assignor to The Bowling Green Rubber Company—both of Toledo, O.
 55,611. Tire tread. Patented July 6, 1920. Term 7 years. C. O. Henderson, assignor to Henderson Tire and Rubber Corp.—both of Columbus, O.
 55,612. Tire tread. Patented July 6, 1920. Term 7 years. C. O. Henderson, assignor to Henderson Tire and Rubber Corp.—both of Columbus, O.
 55,627. Bulletin board representing a man seated behind a desk with tire leaning against the end of it. Patented July 6, 1920. Term 7 years. H. J. Mahin, New York City.
 55,630. Tire. Patented July 6, 1920. Term 14 years. R. P. McElrath, Lakewood, O.
 55,728. Tire. Patented July 6, 1920. Term 14 years. E. A. Tinsman, Willoughby, O., assignor to W. C. Owen, Cleveland, O.
 55,729. Tire. Patented July 6, 1920. Term 14 years. E. A. Tinsman, Willoughby, assignor to W. C. Owen, Cleveland—both in Ohio.
 55,730. Rubber boot. Patented July 6, 1920. Term 14 years. N. E. Tousley, Belmont and A. H. Whorf, assignors to Hood Rubber Co., all of Watertown, Mass.
 55,768. Tire. Patented July 13, 1920. Term 7 years. A. S. Fox, Chicago, Ill.
 55,787. Raincoat. Patented July 13, 1920. Term 7 years. B. Greenberg, Chicago, Ill.
 55,803. Tire-cover. Patented July 13, 1920. Term 14 years. P. M. Lockwood, Kansas City, Mo.
 55,804. Tire-cover. Patented July 13, 1920. Term 7 years. P. M. Lockwood, Kansas City, Mo.



55,585 55,586 55,588 55,600 55,606 55,611 55,612 55,630 55,728 55,729 55,808 55,813 55,832 55,842

- 402,975. The word **ONAZOTE**—rubber tires, tubes, and shock absorbers. C. L. Marshall, Duncon, Doyle Gardens, Harlesden, London, N. W. 10.
 403,339. The word **SAMORE**—rubber and gutta percha goods not included in classes other than No. 40. Samuel Hoare, 40 Sandringham Road, Dalston, London, E. 8.
 403,388. Representation of a fountain within a rectangle with the word **STANDARD** behind the top of the fountain—fountain and stylographic pens, etc. C. Bristow, The Pen Works, Waldram Road, Forest Hill, London, S. E. 23.

NEW ZEALAND.

- 16,618. Representation of a tire with a partridge standing within the lower part—pneumatic and solid tires, inner tubes, casings, tire accessories, mechanical rubber goods, druggists' sundries, and all other goods manufactured from india rubber and gutta percha not included in classes other than No. 40. The F. E. Partridge Rubber Co., Limited, Guelph, Ontario, Canada.
 16,619. The word **PARTRIDGE**—rubber footwear. The F. E. Partridge Rubber Co., Limited, Guelph, Ontario, Canada.
 16,620. The word **PARTRIDGE**—pneumatic and solid tires, inner tubes, casings, and tire accessories; mechanical rubber goods, druggists' sundries; and all other goods manufactured from india rubber and gutta percha not included in classes other than No. 40. The F. E. Partridge Rubber Co., Limited, Guelph, Ontario, Canada.

THE DOMINION OF CANADA.

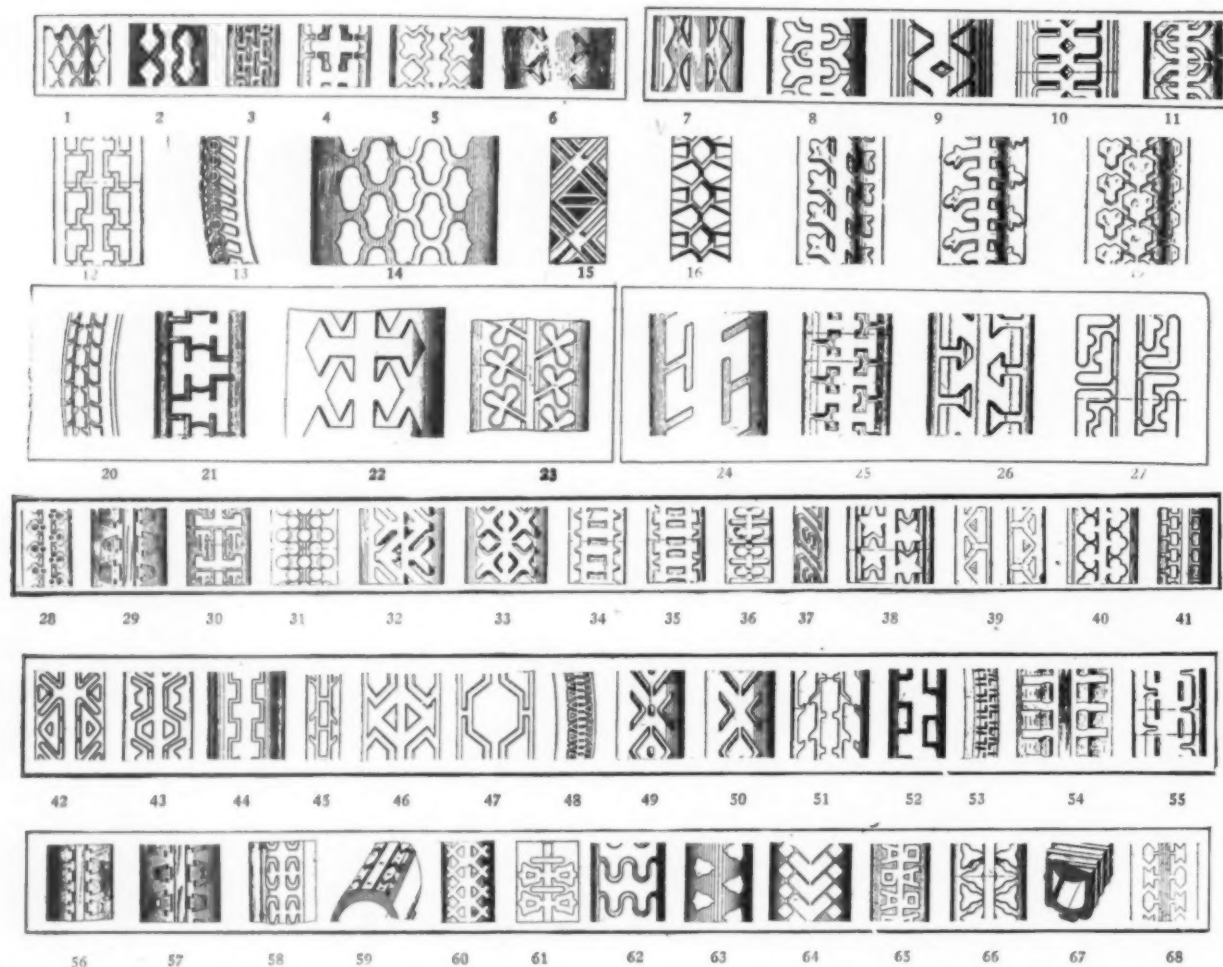
- 26,539. The words **TIRE TREAD**—rubber footwear, heels and soles, clothing, belting, hose, tires, insulating material, cement, druggists' and plumbers' supplies, etc. The Miner Rubber Co., Limited, Montreal, Quebec.

THE DOMINION OF CANADA.

4798. Tire tread. Patented June 22, 1920. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ontario.
 4799. Tire tread. Patented June 22, 1920. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ontario.
 4800. Tire tread. Patented June 22, 1920. Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ontario.
 4801. Tire tread. Patented June 22, 1920. K. & S. Tire & Rubber Goods, Limited, Toronto, Ontario.
 4802. Tire tread. Patented June 22, 1920. K. & S. Tire & Rubber Goods, Limited, Toronto, Ontario.
 4,811. Swimming belt. Patented July 6, 1920. S. Kelso, Toronto, Ont.

Pneumatic Tire Tread Designs.

October, 1919, to March, 1920, and May, 1920.



CUT No.	PATENT No.	PATENTEE OR ASSIGNEE AND ADDRESS.
(1).	54,720.	The Knox Tire & Rubber Co., Mt. Vernon, Ohio.
(2).	54,725.	J. Christy, Cleveland, Ohio.
(3).	54,740.	The Quality Tire & Rubber Co., Anderson, Ind.
(4).	54,758.	L. B. Lyman, Tallmadge, Ohio.
(5).	54,777.	M. L. Wiener, Akron, Ohio.
(6).	54,846.	Kelly-Springfield Tire Co., New York City.
(7).	53,709.	The Bowling Green Rubber Co., Toledo, Ohio.
(8).	53,727.	Richard J. Birch, Cleveland, Ohio.
(9).	53,749.	Ajax Rubber Co., Inc., Millbrook, N. Y.
(10).	53,750.	Ajax Rubber Co., Inc., Millbrook, N. Y.
(11).	53,672.	Richard J. Birch, Cleveland, Ohio.
(12).	53,858.	Arthur E. Pearce, Ashtabula, Ohio.
(13).	53,855.	Premier Tire & Rubber Co., Kansas City, Missouri.
(14).	53,845.	Walter R. Denman, Cleveland, Ohio.
(15).	53,692.	Thermoid Rubber Co., Trenton, New Jersey.
(16).	53,693.	Thermoid Rubber Co., Trenton, New Jersey.
(17).	53,675.	Isaac R. Davies, Lakewood, Ohio.
(18).	53,676.	Isaac R. Davies, Lakewood, Ohio.
(19).	53,677.	Isaac R. Davies, Lakewood, Ohio.
(20).	53,972.	Benjamin H. Pratt, Milwaukee, Wisconsin.
(21).	53,949.	The Standard Tire Co., Willoughby, Ohio.
(22).	53,971.	Arthur E. Pearce, Ashtabula, Ohio.
(23).	53,940.	Harry J. Smith, Binghamton, N. Y.
(24).	53,894.	Walter R. Denman, Cleveland, Ohio.
(25).	53,899.	The Erie Tire & Rubber Co., Cleveland, Ohio.
(26).	53,931.	Frederick A. Oberheu, Detroit, Michigan.
(27).	53,964.	The Williams Foundry & Machine Co., Akron, Ohio.
(28).	54,063.	The Portage Rubber Co., Barberton, Ohio.
(29).	54,070.	F. S. Dickinson, New York City.
(30).	54,090.	G. F. Hoffman, Akron, Ohio.
(31).	54,114.	C. L. Moody and T. Midgely, Springfield, Massachusetts.
(32).	54,120.	The Yale Tire & Rubber Co., New Haven, Connecticut.
(33).	54,121.	The Yale Tire & Rubber Co., New Haven, Connecticut.
(34).	54,122.	The B. F. Goodrich Co., New York City.

CUT No.	PATENT No.	PATENTEE OR ASSIGNEE AND ADDRESS.
(35).	54,123.	The B. F. Goodrich Co., New York City.
(36).	54,124.	The B. F. Goodrich Co., New York City.
(37).	54,143.	H. P. Stansbury and J. P. Davis, Scranton, Pennsylvania.
(38).	54,153.	The Star Rubber Co., Akron, Ohio.
(39).	54,185.	The Victor Rubber Co., Springfield, Ohio.
(40).	54,186.	R. H. Syfers, Indianapolis, Indiana.
(41).	54,193.	The Black Hawk Tire & Rubber Co., Des Moines, Iowa.
(42).	54,236.	The Madison Tire & Rubber Co., Inc., Buffalo, N. Y.
(43).	54,237.	The Madison Tire & Rubber Co., Inc., Buffalo, N. Y.
(44).	54,255.	C. C. Gates, Denver, Colorado.
(45).	54,262.	The Fisk Rubber Co., Chicopee Falls, Massachusetts.
(46).	54,263.	The Fisk Rubber Co., Chicopee Falls, Massachusetts.
(47).	54,264.	The Fisk Rubber Co., Chicopee Falls, Massachusetts.
(48).	54,276.	The Gordon Tire & Rubber Co., Canton, Ohio.
(49).	54,286.	The Savage Tire Co., San Diego, California.
(50).	54,287.	The Savage Tire Co., San Diego, California.
(51).	54,291.	J. Tenney, Jr., Plainfield, N. J.
(52).	54,321.	H. L. Kenyon, Satauket, N. Y.
(53).	54,324.	The Brunswick-Balke-Collender Co., Chicago, Illinois.
(54).	54,337.	F. W. Smith, Rutherford, N. J.
(55).	54,347.	The Cord Tire Corp., Chester, West Virginia.
(56).	54,246.	F. S. Dickinson, New York City.
(57).	54,247.	F. S. Dickinson, New York City.
(58).	54,248.	E. N. Downes, Charlotte, North Carolina.
(59).	54,261.	E. Hopkinson, New York City.
(60).	54,278.	Empire Rubber & Tire Co., Trenton, New Jersey.
(61).	54,281.	F. C. Plouf, Minneapolis, Minnesota.
(62).	54,290.	Gillette Rubber Co., Eau Claire, Wisconsin.
(63).	54,306.	Liberty Tire & Rubber Co., Green Bay, Wisconsin.
(64).	54,318.	Proehl Tire & Rubber Co., Chicago, Illinois.
(65).	54,329.	G. Nowick, Kansas City, Missouri.
(66).	54,330.	W. C. Owen, Cleveland, Ohio.
(67).	54,345.	T. Zeger, Sharpsburg, Pennsylvania.
(68).	54,348.	H. G. Egbert, Dayton, Ohio.

Review of the Crude Rubber Market.

THE CURTAILMENT in tire production that commenced in July was continued during August and is now at the lowest level known in the history of the industry. This means that 8,000 tons of crude rubber consumed monthly in tires must be carried over until conditions change. The industry as a whole, however, is in strong hands, and competent to cope with the unusual situation.

Depression ruled in the crude rubber market during the first week of August, when small interest was shown by manufacturers or dealers other than small lot buying for immediate requirements. The report of another liquidation in the rubber importing business further depressed the market, resulting in a new low level of 29½ cents for both latex crêpe and smoked sheet ribbed, spot rubber.

Quiet conditions continued throughout the month, with slight price advances, due to contract covering on the part of short interests that gave support to a market technically weak through lack of manufacturers' business. The situation is top-heavy. Rubber is constantly going into storage in New York, 20,000 tons being the reported figure, and factory store rooms are filled with rubber.

Arrivals during July were 15,884 tons, compared with 17,965 a year ago. Total arrivals for seven months ended July 31, 1920, were 167,773 tons, compared with 131,694 tons last year. Future arrivals will be less and less, as buying has been restricted in producing centers and surplus stocks stored by the large holders, who are abundantly prepared to meet the temporary contingency.

Spot and future quotations on standard plantation and Brazilian sorts at the first and last of the past month were as follows:

PLANTATIONS. August 2, first latex crêpe, spot, 30 cents; October-December, 34½ cents; January-June, 39¼ cents.

August 26, first latex crêpe, spot, 31 to 31½ cents; October-December, 34 cents; January-June, 38 to 38½ cents.

August 2, ribbed smoked sheets, spot, 29½ cents; October-December, 34 cents; January-June, 39 cents.

August 26, ribbed smoked sheets, spot, 30 to 30½ cents; October-December, 33 to 33½ cents; January-June, 37 cents.

August 2, No. 1 amber crêpe, spot, 29 cents.

August 26, No. 1 amber crêpe, spot, 28 to 29 cents.

August 2, No. 1 rolled brown crêpe, spot, 25 cents.

August 26, No. 1 rolled brown crêpe, spot, 24 cents.

SOUTH AMERICAN PARÁS AND CAUCHO. August 2, upriver, fine, spot, 34½ cents; islands fine, 32 cents; upriver coarse, 22 cents; islands coarse, 20 cents; Cametá coarse, 18 cents; cauchó ball, 23¼ cents.

August 26, upriver fine, spot, 31 to 30 cents; islands fine, 28 cents; upriver coarse, 21½ to 22 cents; islands coarse, 19 cents; Cametá coarse, 17 cents; cauchó ball, 22 cents.

NEW YORK QUOTATIONS.

Following are the New York spot quotations, for one year ago, one month ago, and August 26, the current date:

	September 1, 1919.	August 2, 1920.	August 26, 1920.
PLANTATION HEVEA—			
First latex crêpe.....	\$0.45½ @	\$0.30 @	\$0.31 @
Amber crêpe No. 1.....	.41½ @	.29 @	.29 @
Amber crêpe No. 2.....	.40½ @	.28 @	.28 @
Amber crêpe No. 3.....	.39½ @	.28½ @	.27 @
Amber crêpe No. 4.....	.38½ @	.27½ @	.26 @
Brown crêpe, thick and thin	.38½ @	.29 @	.26 @
Brown crêpe, specky.....	.36½ @	.28 @	.25 @
Brown crêpe, rolled.....	.32 @	.25 @	.24½ @
Smoked sheet, ribbed, standard quality.....	.44 @	.29½ @	.30 @.30½
Smoked sheet, plain stand- ard quality.....	.41 @	.30 @	.29 @

	September 1, 1919.	August 2, 1920.	August 26, 1920.
PLANTATION HEVEA—			
Unsmoked sheet, stand- ard quality.....	\$0.39 @	\$0.25 @	\$0.26 @
Colombo scrap No. 1.....	.33 @	.23 @	.22 @
Colombo scrap No. 2.....	.31 @	.21½ @	.21½ @
EAST INDIAN—			
Assam crêpe.....	*.58 @	@	@
Assam onions.....	@	@	@
Penang black scrap.....	*.40 @	@	@
PONTIANAK—			
Banjerassin.....	.10¾ @	.12 @	.09½ @.11½
Palembang.....	.11¾ @.12	.13 @	.10½ @
Pressed block.....	.21 @	.23 @	.19 @
Sarawak.....	.09¾ @	@	.08¾ @
SOUTH AMERICAN—			
PARÁS—			
Upriver fine.....	.54½ @	.34½ @.35	.31 @.30
Upriver medium.....	.51½ @	.30 @	.29 @.30
Upriver coarse.....	.31½ @	.22 @	.21½ @.22
Upriver weak, fine.....	.40 @	.30 @	.27 @
Islands, fine.....	.48 @	.32 @	.28 @
Islands, medium.....	.44 @.45	.30 @	*.26 @.28
Islands, coarse.....	.21 @	.20 @	.19 @
Cametá, coarse.....	.21½ @	.18 @	.17 @
Madeira, fine.....	.55 @	.37 @	.35 @
Acre Bolivian, fine.....	.54½ @.55	.36 @	.33½ @.34
Peruvian fine.....	.53 @	.32 @	.31 @
Tapajos, fine.....	.53 @	.30 @	.30 @.31
CAUCHO—			
Upper cauchó ball.....	.31 @	.24 @	.21½ @.22
Lower cauchó ball.....	.29 @	.21 @	.18½ @
MANICOBAS—			
Ceará negro heads.....	*.34 @	@	.23 @
Ceará scrap.....	*.29 @	@	.20 @
Manicoba, 30% guarantee	*.32 @	@	.25 @
Mangabeira thin sheet..	*.38 @	@	.28 @
CENTRALS—			
Corinto scrap.....	.31 @	.19 @	.18 @
Esmeralda sausage.....	.31 @	.19 @	.18 @
Central scrap.....	.31 @	.19 @	.18 @
Central scrap and strip..	.29½ @	.17 @	.15 @
Central wet sheet.....	.23 @	.13 @	.13 @
Guayule, 20% guarantee..	.25 @	.28 @	.27 @
Guayule, washed and dried	.35 @	.38 @	.37 @
AFRICANS—			
Niger flake, prime.....	@	.18½ @	@
Benguela, extra No. 1, 28%	*.24 @	.14 @	@
Benguela, No. 2, 32½%..	*.25 @	@	@
Conakry niggers.....	@	@	@
Congo prime, black upper..	.34½ @	@	@
Congo, prime, red upper..	.34 @.35	@	@
Kassai black.....	@	@	@
Kassai red.....	@	@	@
Massai sheets and strings.	@	@	@
Rio Nunez ball.....	@	@	@
Rio Nunez sheets and strings	@	@	@
GUTTA PERCHA—			
Gutta Siak.....	.20 @.23	.24 @.25	.20½ @.22½
Red Macassar.....	2.50 @2.60	2.80 @	2.00 @2.95
BALATA—			
Block, Ciudad Bolivar....	.70 @.74	.72 @	.67 @.68
Colombia.....	.56 @.58	.50 @.51	.47 @
Panama.....	.45 @.48	@	.40 @
Surinam sheet.....	.90 @.92	.73 @	.75 @
Surinam amber.....	.92 @.94	.82 @	.82 @

*Nominal.

RECLAIMED RUBBER.

August business in reclaimed rubber has continued to be quiet and in about the same volume as the previous month. Transportation facilities have improved somewhat, with the result that deliveries are being made more promptly, although delays are still experienced. The tire production curtailment has to a certain degree affected this market, and is reflected in fewer inquiries from solid tire makers. Prices on all grades are practically the same as a month ago.

NEW YORK QUOTATIONS.

August 26, 1920.

Prices subject to change without notice.

STANDARD RECLAIMS:	
Floating.....	\$0.27 @ \$0.32
Friction.....	.25 @ .30
Mechanical.....	.12 @ .13
Red.....	.22 @ .23
Shoe.....	.15¾ @ .16¾
Tires, auto.....	.16 @ .17
Truck.....	.12½ @ .13½
White.....	.22 @ .25

THE MARKET FOR COMMERCIAL PAPER.

In regard to the financial situation, Albert B. Beers, broker in crude rubber and commercial paper, No. 1 Liberty street, New York City, advises as follows:

"During August the demand for commercial paper has been very limited, and almost entirely from out-of-town banks, rates ruling at 8 to 8½ per cent for the best rubber names."

COMPARATIVE HIGH AND LOW NEW YORK SPOT RUBBER PRICES.

	August.		
	1920.*	1919.	1918.
PLANTATIONS—			
First latex crepe.....	\$0.33¼ @ \$0.29½	\$0.42½ @ \$0.39½	\$0.63 @ \$0.63
Smoked sheet ribbed.....	.33¼ @ .29½	.41½ @ .38½	.62 @ .62
PARAS—			
Upriver, fine.....	.35 @ .27½	.54¼ @ .55	.68 @ .68
Upriver, coarse.....	.23½ @ .20½	.33 @ .32	.40 @ .40
Islands, fine.....	.32 @ .29	.47½ @ .47½	.59 @ .59
Islands, coarse.....	.20 @ .19	.21½ @ .21½	.27 @ .27
Camets.....	.18 @ .18	.21½ @ .21½	.28 @ .28

*Figured to August 26.

AMSTERDAM RUBBER MARKET.

JOOSTEN & JANSSEN, Amsterdam, report [August 14, 1920]:

In the beginning of the week prices of rubber showed a further downward movement and the tendency remained quiet. There was a fair demand, but at moderate prices. Some owners of spot parcels were rather inclined to sell, and when they could dispose of their lots at satisfactory prices, they made use of this opportunity, in consequence of which there was after all a good turnover. Only now and then there was any business on the terminal market; prices remained practically unchanged. At the close prime *Hevea* on spot is quoted at f. 1.12; October, f. 1.12; December, f. 1.15; March, f. 1.16; with sellers; buyers, 2 cents lower.

ANTWERP RUBBER MARKET.

GRISAR & CO., Antwerp, report [July 30, 1920]:

The market tendency continues feeble in consequence of the absence of orders for the United States. Prices have still further declined, and little business was done. Closing prices were as follows: Spot, July, 1s. 9¼d.; August-September, 1s. 9¼d.—1s. 10¼d.; August-December, 1s. 10¼d.—1s. 10¼d.; January-March, 2s.—2s. 1d. Fine Para, 1s. 10¼d.

Statistics for the week were as follows: Arrivals, 1,047 tons; sales, 627 tons; stock, 24,105 tons against 27,602 in 1919. Small quantities of African rubber were sold; 263 kilos of red Congo Kassai I and II, at 7.50 francs; 651 red Congo Kassai, Butala grade, at 5.50 francs; 1,760 kilos Congo Plantation *Hevea* and some *Funtumia* at secret price.

Arrived per S. S. *Matoba*: Various, 3,125 kilos. Stock on hand, about 755 tons.

Weak reports from London caused the local futures market price to decline 0.70 francs; at this new rate, buyers have the advantage. Transactions amounting to only 30,000 kilos were made. Closing quotations, each month: August-July, 9.80 francs. Tendency, quiet.

SINGAPORE RUBBER MARKET.

GUTHRIE & CO., LIMITED, Singapore, report [July 15, 1920]:

Lower London quotations, news of a demoralized New York market and rumors of a failure in that quarter, have had a considerable weakening effect on our market since we last reported and the attendance at the opening of the weekly rubber auction yesterday was poor with few buyers. The earlier catalogs were more or less neglected, but later a moderate demand sprang up, on sellers showing a desire to meet buyers on such lots as they were interested in. The bidding was confined to standard and lower grades, off quality lots of sheet and crepe being unsalable.

Fine pale crepe sold up to 73 cents (one lot in cases sold at 74½ cents and four lots loose at 74 cents) showing declines of 3½ and 3 cents, respectively. Brown crepes shared in the general decline and were 3½ cents cheaper on the week, while dark and barky crepes dropped 2¼ cents. The tone of the market may be judged from the fact that only 420 tons were sold out of a catalogued quantity of 904 tons.

The following is the course of values:

	In Singapore per Pound. ¹	Sterling Equivalent per Pound in London.
Sheet, fine ribbed smoked.....	72c @ 73½c	1/10½ @ 1/11
Sheet, good ribbed smoked.....	58 @ 72	1/6½ @ 1/10½
Crepe, fine pale.....	72 @ 73	1/11½ @ 1/11½
Crepe, good pale.....	58 @ 72	1/7½ @ 1/11½
Crepe, fine brown.....	53 @ 63	1/7½ @ 1/8½
Crepe, good brown.....	48 @ 56½	1/4½ @ 1/5½
Crepe, dark.....	48 @ 51	1/2 @ 1/3½
Crepe, bark.....	40 @ 45	1/2 @ 1/3½

¹Quoted in Straits Settlements currency; \$1 = \$0.567 United States currency.

EXPORTS OF CRUDE RUBBER FROM BELAWAN (DELI), SUMATRA.

	April.		Four Months Ended April 30.	
	1919.	1920.	1919.	1920.
To Netherlands.....kilos		207,424		998,892
United Kingdom.....	498,689	302,930	1,431,545	1,132,914
Italy.....			61,120	
Belgium.....		54,040		54,135
United States.....	306,762	639,037	2,134,486	3,618,335
Penang.....	28,750	44,047	97,842	259,632
Singapore.....	835,114	639,279	4,709,846	1,877,679
Japan.....			980	
Australia.....	29,010		177,690	
Totals.....kilos	1,698,325	1,886,757	8,613,509	8,491,587

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official report from Singapore states that the export of cultivated rubber from Straits Settlements ports in the month of June amounted to 11,663 tons (of which 1,976 tons were transhipped). This compares with 15,617 tons in May and 5,059 tons in the corresponding month last year. The total exports for the first half of the current year amounted to 79,435 tons, as against 82,725 tons last year and 42,180 tons in 1918. The following are the comparative statistics:

	1918.	1919.	1920.
January.....tons	4,302	14,404	13,125
February.....	2,334	15,661	17,379
March.....	8,858	20,908	5,931
April.....	6,584	10,848	15,720
May.....	13,587	15,845	15,617
June.....	6,515	5,059	11,663
Totals.....	42,180	82,725	79,435

FEDERATED MALAY STATES RUBBER EXPORTS.

An official report from Kuala Lumpur states that the exports of plantation rubber from the Federated Malay States for the month of June amounted to 9,049 tons, compared with 7,627 tons in May and 7,094 tons in the corresponding month last year.

The total exports for six months in the current year were 55,475 tons, against 50,717 tons for the corresponding period last year and 40,557 tons in 1918. Appended are the comparative statistics:

	1918.	1919.	1920.
January.....tons	7,588	7,163	11,119
February.....	6,820	10,809	9,781
March.....	7,709	10,679	9,524
April.....	7,428	7,664	8,375
May.....	5,851	7,308	7,627
June.....	5,161	7,094	9,049
Totals.....	40,557	50,717	55,475

PLANTATION RUBBER EXPORTS FROM JAVA.

	May.		Five Months Ended May 30.	
	1919.	1920.	1919.	1920.
To Netherlands.....kilos	2,000	318,000	122,000	1,850,000
Great Britain.....	780,000	407,000	3,681,000	2,731,000
Germany.....		17,000		35,000
France.....			176,000	
Belgium.....		14,000		14,000
United States.....	1,255,000	1,362,000	7,876,000	7,041,000
Singapore.....	545,000	176,000	2,536,000	1,884,000
Japan.....	1,000	6,000	179,000	184,000
Australia.....		30,000		46,000
Other countries.....			175,000	
Totals.....kilos	2,583,000	2,330,000	14,745,000	13,785,000
Ports of origin:				
Tandjong Priok.....	1,677,000	1,274,000	7,598,000	6,665,000
Samarang.....	40,000	8,000	243,000	194,000
Soerabaya.....	865,000	1,045,000	6,328,000	11,800,000

*Not elsewhere specified.

RUBBER EXPORTS FROM PENANG.

	Six Months Ended June 30.	
	1919.	1920.
To Great Britain.....piculs ¹	113,015	121,115
Europe.....		1,544
United States.....	60,469	103,651
Totals.....	173,484	226,310

¹One picul equals 133½ pounds.

CEYLON RUBBER IMPORTS AND EXPORTS.

IMPORTS.		
	January 1, to July 12.	
	1919.	1920.
Crude rubber:		
From Straits Settlements.....pounds	1,386,797	1,555,099
India.....	710,084	791,039
Burma and other countries.....		26,259
Totals.....	2,096,881	2,372,397
EXPORTS.		
Crude rubber:		
To United Kingdom.....	17,354,739	17,869,744
Belgium.....	29,120	106,830
France.....	330,010	440,817
Germany.....		108,228
Netherlands.....		28
Italy.....		89,600
Australia.....		56
Victoria.....		98,755
United States.....	37,308,831	22,078,498
New South Wales.....	127,092	180,094
Canada and Newfoundland.....	260,026	425,600
India.....	2,313	586
Straits Settlements.....	454	44,800
Japan.....	164,186	157,667
Totals.....	55,675,526	41,592,217

(Compiled by the Ceylon Chamber of Commerce.)

CRUDE RUBBER ARRIVALS AT ATLANTIC AND PACIFIC PORTS AS STATED BY SHIPS' MANIFESTS.

PARAS AND CAUCHO AT NEW YORK.

JULY 24. By the S. S. *Manco*, from Pará.

	Fine.	Medium.	Coarse.	Cauchó.	Totals.
Poel & Kelly.....					33,516
H. A. Astlett & Co.....	5,000		14,000		1,372
Neuss, Hesslein & Co.....					36,260
Wm. Schall & Co.....					13,034
Meyer & Brown, Inc.....	18,742	13,230	4,410		36,382

JULY 24. By the S. S. *Manco*, from Manáos.

Poel & Kelly.....					12,936
W. R. Grace & Co.....					3,136
Various.....					27,832

JULY 24. By the S. S. *Manco*, from Iquitos.

H. A. Astlett & Co.....					1,960
Meyer & Brown, Inc.....					18,620
Various.....					

JULY 31. By the S. S. *Arna*, from Montevideo.

Neuss, Hesslein & Co.....					9,918
Various.....					2,742

AUGUST 6. By the S. S. *Newton*, from Pará.

Paul Bertuch.....			26,917		26,917
H. A. Astlett & Co.....			27,000	36,000	63,000

AUGUST 8. By the S. S. *Ben Nevis*, from Pará.

Paul Bertuch.....			26,917		26,917
Meyer & Brown, Inc.....		1,120	73,920	1,680	76,720

AUGUST 20. By the S. S. *Manchurian Prince*, from Pará.

Paul Bertuch.....			13,095		13,095
Meyer & Brown, Inc.....		22,400			22,400

AUGUST 20. By the S. S. *Rembrandt*, from Pará.

H. A. Astlett & Co.....		6,000	3,000		9,000
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PLANTATIONS.

(Figured 180 pounds to the bale or case.)

JULY 22. By the S. S. *Muncaster Castle*, at New York.

	Shipment from:	Shipped to:	Pounds.	Totals.
Edward Boustead & Co., Inc.	Singapore	New York	27,000	
L. Littlejohn & Co., Inc.	Singapore	New York	216,540	
Poel & Kelly.....	Singapore	New York	91,620	
Aldens' Successors, Inc.	Singapore	New York	260,720	
Fred Stern & Co.....	Singapore	New York	45,540	
F. R. Henderson & Co., Inc.	Singapore	New York	231,480	
Chas. T. Wilson Co., Inc.	Singapore	New York	419,940	
Thornett & Fehr, Inc.	Singapore	New York	46,800	
William H. Stiles & Co., Inc.	Singapore	New York	122,760	
The Goodyear Tire & Rubber Co.	Singapore	Akron	641,960	
Meyer & Brown, Inc.	Singapore	New York	22,414	
Various.....	Singapore	New York	1,199,740	3,326,514

JULY 22. By the S. S. *Port Napier*, at New York.

T. D. Downing & Co.	London	New York	82,980	
Various.....	London	New York	178,020	261,000

JULY 23. By the S. S. *Succie* at New York.

Edward Boustead & Co.	Singapore	New York	257,760	
Eastern Rubber Co.	Singapore	New York	274,320	
Poel & Kelly.....	Singapore	New York	534,240	
Fred Stern & Co.	Singapore	New York	109,800	
Meyer & Brown, Inc.	Singapore	New York	11,221	
Various.....	Singapore	New York	696,200	1,883,541

JULY 26. By the S. S. *Amur Maru*, at New York.

Fred Stern & Co.	Singapore	New York	33,600	
F. R. Henderson & Co.	Singapore	New York	130,320	
Mitsui & Co., Ltd.	Singapore	New York	80,640	
Firestone Tire & Rubber Co.	Singapore	Akron	791,280	
Various.....	Singapore	New York	728,100	
Various.....	Deli	New York	56,940	1,820,880

JULY 26. By the S. S. *Rangoon Maru*, at New York.

Chas. T. Wilson Co., Inc.	Colombo	New York	256,680	
Various.....	Colombo	New York	148,500	405,180

JULY 26. By the S. S. *Eurymachus*, at New York.

F. R. Henderson & Co.	Singapore	New York	149,940	
Thos. A. Desmond & Co.	Singapore	New York	216,360	
Rubber Trading Co.	Singapore	New York	172,980	
Vernon Metal & Produce Co.	Singapore	New York	28,800	
L. Littlejohn & Co., Inc.	Singapore	New York	277,740	
Balfour, Williamson & Co.	Singapore	New York	119,880	
Aldens' Successors, Inc.	Singapore	New York	20,160	
Overseas Export & Import Co.	Singapore	New York	10,080	
Meyer & Brown, Inc.	Singapore	New York	167,922	
Fred Stern & Co.	Singapore	New York	20,160	
Rubber Trading Co.	Singapore	New York	73,440	
L. Littlejohn & Co., Inc.	Singapore	New York	208,080	
The Goodyear Tire & Rubber Co.	Singapore	Akron	261,000	
Edward Maurer Co., Inc.	Singapore	New York	228,420	
Various.....	Singapore	New York	1,601,940	
Various.....	Penang	New York	188,460	
Various.....	Pt. Sw't'nh'm	New York	204,120	
Various.....	Deli	New York	1,450,620	5,400,102

Shipment from: Shipped to: Pounds. Totals.

JULY 28. By the S. S. *Jeseric*, at New York.

Various.....	Calcutta	New York	51,480	51,480
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JULY 23. By the S. S. *Benghalis*, at San Francisco.

The Goodyear Tire & Rubber Co.	Belawan	Akron	308,160	
Savage Tire Corp.	Soerabaya	San Diego	101,520	
Savage Tire Corp.	Batavia	San Diego	49,680	459,360

JULY 30. By the S. S. *Tangama Maru*, at New York.

G. Kuwahara Co.	Osaka	New York	234,000	
Pacific Trading Corp. of America	Singapore	New York	145,980	
Mitsui & Co., Ltd.	Singapore	New York	540	380,520

JULY 30. By the S. S. *City of Colombo*, at New York.

Meyer & Brown, Inc.	Singapore	New York	347,200	347,200
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JULY 31. By the S. S. *City of Lincoln*, at New York.

Chas. T. Wilson Co., Inc.	Colombo	New York	190,620	
Baring Bros.	Colombo	New York	403,200	
Hadden & Co.	Colombo	New York	28,800	
Wm. Brandt & Sons	Colombo	New York	23,760	
Meyer & Brown, Inc.	Colombo	New York	448,000	1,094,380

JULY 31. By the S. S. *Virgilia*, at New York.

T. D. Downing & Co.	Liverpool	New York	78,300	
Poel & Kelly.....	Liverpool	New York	39,420	
Various.....	Liverpool	New York	142,920	260,640

JULY 31. By the S. S. *City of Michigan*, at New York.

T. D. Downing & Co.	London	New York	92,880	92,880
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JULY 31. By the S. S. *Vasconia*, at New York.

Fred Stern & Co.	Liverpool	New York	39,060	39,060
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JULY 31. By the S. S. *City of Colombo*, at New York.

Poel & Kelly.....	Pt. Sw't'nh'm	New York	12,240	
L. Littlejohn & Co., Inc.	Pt. Sw't'nh'm	New York	4,860	
Various.....	Pt. Sw't'nh'm	New York	229,860	
Poel & Kelly.....	Port Dickson	New York	11,700	
Meyer & Brown, Inc.	Penang	New York	108,000	
Rubber Trading Co.	Penang	New York	72,000	
L. Littlejohn & Co., Inc.	Penang	New York	9,900	
General Rubber Co.	Tandj'g Balcé	New York	452,700	
Aldens' Successors, Inc.	Deli-Belawan	New York	122,220	
L. Littlejohn & Co., Inc.	Deli-Belawan	New York	33,480	
W. G. Ryckman, Inc.	Deli-Belawan	New York	1,980	
Firestone Tire & Rubber Co.	Deli-Belawan	Akron	61,560	
The B. F. Goodrich Co.	Singapore	Akron	598,680	
Hood Rubber Co.	Singapore	Watertown	109,080	
L. Littlejohn & Co., Inc.	Singapore	New York	240,120	
William H. Stiles & Co.	Singapore	New York	27,180	
Meyer & Brown, Inc.	Singapore	New York	347,200	
Chas. T. Wilson Co., Inc.	Singapore	New York	120,960	
A. C. Fox & Co.	Singapore	New York	132,840	
H. A. Forbes & Co.	Singapore	New York	27,000	
Thornett & Fehr, Inc.	Singapore	New York	40,320	
F. R. Henderson & Co.	Singapore	New York	279,000	
Thos. A. Desmond & Co.	Singapore	New York	40,320	
Various.....	Singapore	New York	1,866,480	
Poel & Kelly.....	Malacca	New York	22,140	
Various.....	Deli-Belawan	New York	36,000	5,007,820

AUGUST 1. By the S. S. *Telemachus*, at New York.

J. T. Johnstone & Co.	Singapore	New York	182,000	
Fred Stern & Co.	Singapore	New York	331,520	
H. A. Astlett & Co.	Singapore	New York	168,000	
Pacific Trading Corp. of America	Singapore	New York	99,540	
Thos. A. Desmond & Co.	Singapore	New York	12,060	
Aldens' Successors, Inc.	Singapore	New York	38,520	
Meyer & Brown, Inc.	Singapore	New York	571,121	
Various.....	Kelantan	New York	20,160	
Various.....	Jamboanga	New York	10,800	
Various.....	Medan	New York	137,340	
Various.....	Deli	New York	918,000	
Various.....	Singapore	New York	4,122,080	6,111,141

AUGUST 1. By the S. S. *Bolton Castle*, at New York.

L. Littlejohn & Co., Inc.	Singapore	New York	126,000	
The Goodyear Tire & Rubber Co.	Singapore	Akron	104,940	
Chas. T. Wilson Co., Inc.	Singapore	New York	130,860	
A. C. Fox & Co.	Singapore	New York	45,000	
The Fisk Rubber Co.	Singapore	Chic'pee Falls	126,000	
Poel & Kelly.....	Singapore	New York	553,140	
Thos. A. Desmond & Co.	Singapore	New York	30,240	
Hood Rubber Co.	Singapore	Watertown	67,320	
The B. F. Goodrich Co.	Singapore	Akron	369,360	
Fred Stern & Co.	Singapore	New York	89,000	
Meyer & Brown, Inc.	Singapore	New York	190,198	
Various.....	Singapore	New York	1,023,360	2,855,418

AUGUST 2. By the S. S. *Port Bowen*, at New York.

T. D. Downing & Co.	London	New York	90,260	
Various.....	London	New York	59,220	149,480

AUGUST 3. By the S. S. *Persia Maru*, at San Francisco.

Various.....	Hong Kong	San Fran	177,480	177,480
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AUGUST 4. By the S. S. *Yancagata Maru*, at New York.

Chas. T. Wilson Co., Inc.	Colombo	New York	71,280	
Vernon Metal & Produce Co.	Colombo	New York	63,000	
Various.....	Colombo	New York	130,140	264,420

					AFRICANS.				
	Shipment from:	Shipped to:	Pounds.	Totals.	Shipment from:	Shipped to:	Pounds.	Totals.	
AUGUST 4. By the S. S. <i>Horaisan Maru</i> , at Seattle.					JULY 22. By the S. S. <i>Farnworth</i> , at New York.				
Mitsui & Co., Ltd.....	Kobe	Seattle	72,000		Various	Bordeaux	New York	25,415	25,415
Trans-Oceanic Co.	Kobe	Seattle	74,340	146,340	AUGUST 9. By the S. S. <i>Kroonland</i> , at New York.				
AUGUST 5. By the S. S. <i>Mesaba</i> , at New York.					Various	Antwerp	New York	25,185	25,185
T. D. Downing & Co....	London	New York	86,220	86,220	AUGUST 15. By the S. S. <i>Coronia</i> , at New York.				
AUGUST 5. By the S. S. <i>Mattama</i> , at Vancouver.					Meyer & Brown, Inc....	Liverpool	New York	11,200	11,200
Meyer & Brown, Inc....	Singapore	New York	134,400	134,400	PONTIANAK.				
AUGUST 6. By the S. S. <i>Gaelic Prince</i> , at New York.					JULY 22. By the S. S. <i>Muncaster Castle</i> , at New York.				
I. T. Johnstone & Co..	Penang	New York	6,200		Baring Bros.	Singapore	New York	65,700	
The B. F. Goodrich Co.	Penang	Chic'pee Falls	130,140		L. Littlejohn & Co., Inc.	Singapore	New York	307,800	
Dunlop Tire & Rubber	Singapore	Toronto	189,720		Various	Singapore	New York	29,700	403,200
Goods Co., Ltd.....					JULY 23. By the S. S. <i>Suveric</i> , at New York.				
Meyer & Brown, Inc....	Singapore	New York	750,400		United Malaysian Rubber Co., Limited.....	Singapore	New York	267,300	
Fred Stern & Co.....	Singapore	New York	501,900		Various	Singapore	New York	257,400	524,700
Boston Insulated Wire & Cable Co.	Singapore	Dorchester	6,300		JULY 26. By the S. S. <i>Amur Maru</i> , at New York.				
The Fisk Rubber Co....	Singapore	Chic'pee Falls	165,600		Baring Brothers	Singapore	New York	105,000	
Various	Singapore	New York	3,023,640	4,773,900	Various	Singapore	New York	1,500	106,500
AUGUST 9. By the S. S. <i>Edinburgh</i> , at New York.					JULY 31. By the S. S. <i>City of Colombo</i> , at New York.				
Various	Colombo	New York	20,160	20,160	Fred Stern & Co.....	Colombo	New York	52,800	
AUGUST 17. By the S. S. <i>Santa Clara</i> , at New York.					The United Malaysian Rubber Co., Limited..	Singapore	New York	183,680	
Meyer & Brown, Inc....	Colombo	New York	395,360	395,360	Various	Colombo	New York	354,500	590,980
AUGUST 18. By the S. S. <i>Howich Hall</i> , at New York.					AUGUST 1. By the S. S. <i>Bolton Castle</i> , at New York.				
Meyer & Brown, Inc....	Singapore	New York	56,000		The Goodyear Tire & Rubber Co.	Singapore	Akron	3,900	
H. A. Astlett & Co....	Singapore	New York	113,200		F. R. Henderson & Co..	Singapore	New York	3,000	
Fred Stern & Co.....	Singapore	New York	127,680		Various	Singapore	New York	867,900	874,800
J. T. Johnstone & Co., Inc.	Singapore	New York	80,640	377,520	AUGUST 6. By the S. S. <i>Gaelic Prince</i> , at New York.				
AUGUST 19. By the S. S. <i>Baueric</i> , at New York.					The United Malaysian Rubber Co., Limited..	Singapore	New York	852,689	
Fred Stern & Co.....	Singapore	New York	22,440	22,440	Various	Singapore	New York	115,500	968,189
AUGUST 19. By the S. S. <i>Alaska Maru</i> , at New York.					AUGUST 19. By the S. S. <i>Alaska Maru</i> , at New York.				
Fred Stern & Co.....	Singapore	New York	147,500	147,500	The United Malaysian Rubber Co., Limited..	Singapore	New York	762,849	762,849
AUGUST 19. By the S. S. <i>Rondo</i> , at New York.					AUGUST 23. By the S. S. <i>Persian Prince</i> , at New York.				
Fred Stern & Co.....	Belawan Deli	New York	56,000		The United Malaysian Rubber Co., Limited..	Singapore	New York	92,068	92,068
United Malaysian Rubber Co.	Borneo	New York	7,000	63,000	GUAYULE.				
AUGUST 20. By the S. S. <i>West Harts</i> , at San Francisco.					JULY 31. By the S. S. <i>Ocmulga</i> , at New York.				
Various	Hong Kong	San Fran.	198,900	198,900	Various	Mexican Ports	New York	2,250	2,250
AUGUST 20. By the S. S. <i>City of Manila</i> , at New York.					AUGUST 4. By rail at Eagle Pass, Texas.				
Meyer & Brown, Inc....	Colombo	New York	389,760	389,760	Continental - Mexican Rubber Co.	Mexico	New York	60,390	
AUGUST 20. By the S. S. <i>Persian Prince</i> , at New York.					Continental - Mexican Rubber Co.	Mexico	Akron	66,000	126,390
Meyer & Brown, Inc....	Singapore	New York	44,800		AUGUST 4. By rail, at Laredo, Tex.				
Fred Stern & Co.....	Singapore	New York	100,800	145,600	Continental - Mexican Rubber Co.	Mexico	New York	79,000	79,000
AUGUST 21. By the S. S. <i>Rotterdam</i> , at New York.					AUGUST 10. By rail at Eagle Pass, Texas.				
Meyer & Brown, Inc....	Rotterdam	New York	67,200	67,200	Continental - Mexican Rubber Co.	Mexico	Various	52,000	52,000
BALATA.					AUGUST 16. By rail, at Eagle Pass, Tex.				
JULY 24. By the S. S. <i>Cristobal</i> at New York.					Continental - Mexican Rubber Co.	Mexico	Various	70,000	70,000
Wellman Peck & Co....	Cristobal	New York	900		MANICOBAS.				
Ultramares Corp.	Cristobal	New York	3,300		JULY 30. By the S. S. <i>Lake Silicunus</i> , at New York.				
Various	Cristobal	New York	150	4,350	J. H. Rossbach & Bros..	Brazil	New York	18,040	18,040
JULY 28. By the S. S. <i>Mayaro</i> , at New York.					GUTTA PERCHA.				
Middleton & Co., Limited	Demerara	New York	9,793	9,793	JULY 22. By the S. S. <i>Muncaster Castle</i> , at New York.				
AUGUST 1. By the S. S. <i>Aurora</i> , at New York.					L. Littlejohn & Co., Inc.	Singapore	New York	111,600	111,600
Wm. Schall & Co.....	Cape Haytien	New York	6,150	6,150	JULY 23. By the S. S. <i>Suveric</i> , at New York.				
AUGUST 1. By the S. S. <i>Philadelphia</i> , at New York.					Fred Stern & Co.....	Singapore	New York	37,800	37,800
Various	Southampton	New York	27,900	27,900	JULY 31. By the S. S. <i>City of Colombo</i> , at New York.				
AUGUST 3. By the S. S. <i>Aurora</i> , at New York.					Various	Colombo	New York	12,000	12,000
William Schall & Co....	Dutch Guiana	New York	25,677	25,677	AUGUST 1. By the S. S. <i>Bolton Castle</i> , at New York.				
AUGUST 9. By the S. S. <i>Carrillo</i> , at New York.					L. Littlejohn & Co., Inc.	Singapore	New York	44,100	
Ultramares Corp.	Kingston	New York	9,750		Various	Singapore	New York	59,700	103,800
G. Amsinck & Co., Inc..	Kingston	New York	4,050	13,800	GUTTA SIAK.				
AUGUST 9. By the S. S. <i>Colon</i> , at New York.					JULY 22. By the S. S. <i>Muncaster Castle</i> , at New York.				
Isaac Brandon & Bros..	Cristobal	New York	450		Various	Singapore	New York	77,100	77,100
American Trading Co....	Cristobal	New York	2,400	2,950	JULY 30. By the S. S. <i>City of Colombo</i> , at New York.				
AUGUST 9. By the S. S. <i>Allianca</i> , at New York.					Fred Stern & Co.....	Singapore	New York	11,200	11,200
Various	Cristobal	New York	3,450	3,450	AUGUST 1. By the S. S. <i>Bolton Castle</i> , at New York.				
CENTRALS.					L. Littlejohn & Co., Inc.	Singapore	New York	25,800	25,800
JULY 24. By the S. S. <i>Cristobal</i> , at New York.					AUGUST 6. By the S. S. <i>Gaelic Prince</i> , at New York.				
American Trading Co....	Cristobal	New York	5,550		Various	Singapore	New York	102,900	102,900
G. Amsinck & Co., Inc..	Cristobal	New York	5,250		AUGUST 19. By the S. S. <i>Alaska Maru</i> , at New York.				
Chas. B. Griffin.....	Cristobal	New York	16,200		The United Malaysian Rubber Co., Limited..	Singapore	New York	134,400	134,400
Wellman, Peck & Co....	Cristobal	New York	7,800						
Ultramares Corp.	Cristobal	New York	5,700						
A. M. Capen's Sons, Inc.	Cristobal	New York	2,550	43,050					
AUGUST 2. By the S. S. <i>Lake Faunier</i> , at New York.									
Ultramares Corp.	Cartegena	New York	3,900	3,900					
AUGUST 9. By the S. S. <i>Allianca</i> , at New York.									
Cowdry & Co.....	Cristobal	New York	9,750						
Various	Cristobal	New York	1,950	11,700					

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK.

	June.			
	1919.		1920.	
	Pounds.	Value.	Pounds.	Value.
IMPORTS.				
UNMANUFACTURED—free:				
Crude rubber:				
From Belgium			75,335	\$29,674
France			275,975	80,334
Netherlands			1,928,772	904,276
Portugal			598,664	123,667
Spain			165	41
England	3,209,644	\$1,433,961	5,408,155	2,354,919
Canada	1,070	764	777	389
Costa Rica			1,613	639
Guatemala	3,185	791	902	226
Trinidad			83	33
Nicaragua	11,808	3,151	12,366	3,389
Panama	23,917	11,214	450	135
Salvador	16,019	10,888		
Mexico	132,276	30,424	20,357	13,025
Bolivia	77,881	35,448	4,132	2,193
Brazil	3,138,771	854,559	2,264,845	631,506
Colombia	37,991	14,682	82,875	24,136
Ecuador	4,490	1,795	23,082	6,656
Peru	87,934	30,046		
Venezuela	10,867	5,642	2,861	1,743
British India	1,743,003	819,382	391,826	182,582
Dutch Guiana			12,048	8,189
Straits Settlements	13,566,201	5,506,868	14,348,557	6,509,587
British E. Indies	3,946,968	1,775,282	4,367,387	2,096,661
Dutch E. Indies	2,470,450	1,003,760	5,778,264	2,644,246
China			100,800	40,344
Japan	66,752	30,605		
Philippines			42,959	14,250
British W. Africa	107,126	16,286		
Australia			900	465
Totals	28,656,353	\$11,585,548	35,744,150	\$15,673,305
Jelutong (Pontianak):				
From Netherlands			223,900	\$18,806
Straits Settlements	940,510	\$98,686	749,937	165,034
Dutch E. Indies	1,243,232	190,559	228,259	19,273
Totals	2,183,742	\$289,245	1,202,096	\$203,113
Gutta percha:				
From France	44,800	\$9,311		
England	83,473	18,793		
Straits Settlements	377,162	63,242	442,777	\$91,722
Dutch E. Indies	102,674	10,678	203,103	28,829
Totals	608,109	\$102,024	645,880	\$120,551
Balata:				
From England	22,790	\$18,232	7,778	\$6,720
Panama	22,060	6,601	9,835	4,111
Brazil			4,222	5,589
Colombia			19,532	7,478
British Guiana	18,806	16,017	24,215	16,393
Dutch Guiana	415	303	45,898	32,130
French Guiana			22,711	13,336
Venezuela	12,067	7,685	7,492	4,504
Totals	89,758	\$54,839	141,683	\$88,261
Reclaimed and scrap rubber	497,750	38,264	669,182	36,883
Totals, unmanufactured	32,035,712	\$12,069,920	38,402,991	\$16,122,113
Manufactures of rubber and gutta percha		48,288		104,856
Rubber substitutes, dutiable	12,134	2,102	25	24
Chicle	250,108	66,898	201,321	110,715

EXPORTS OF DOMESTIC MERCHANDISE.

MANUFACTURED:				
Automobile tires				\$2,138,814
Inner tubes				228,805
Solid tires				127,466
All other tires				36,106
Belting				176,974
Hose				113,784
Packing				50,485
Rubber boots	15,260	33,933	7,027	26,882
Rubber shoes	415,357	313,046	368,038	366,677
Soles and heels				47,999
Druggists' sundries		109,602		86,110
Other mfrs. of rubber		504,420		443,726
Totals, manufactured		\$3,788,910		\$3,853,828
Insulated wire		\$1,364,992		\$423,154
Fountain pens	40,738	51,672	43,632	41,103
Suspenders and garters		262,505		375,536
Chewing gum		213,601		97,978
UNMANUFACTURED—free:				
Reclaimed and scrap rubber	354,895	54,311	321,663	39,235

FOREIGN EXPORTS.

Crude rubber	35,533	\$16,480	125,183	\$55,863
Balata	22,335	15,155	9,214	4,509
Rubber manufactures				324

PORT OF BOSTON.

IMPORTS.				
UNMANUFACTURED—free:				
Crude rubber:				
From England	78,376	\$32,342	252,220	\$79,132
Canada	14,239	6,835		
Straits Settlements	123,343	55,004		
British East Indies	37,052	10,007	108,540	35,835
Totals	253,010	\$104,188	360,760	\$114,967

	June.			
	1919.		1920.	
	Pounds.	Value.	Pounds.	Value.
Gutta percha				
Rubber scrap and reclaimed	16,661	1,215	28,592	2,110
Rubber manufactures...dutiabie		1,128		6,498

EXPORTS.

MANUFACTURED:				
Automobile tires				\$2,494
Inner tubes				253
Solid tires				109
Belting				6,112
Hose				1,408
Packing				290
Rubber boots				11,182
Rubber heels	53,907	30,284	324,660	287,344
Soles and heels				3,676
Druggists' sundries		2,292		7,546
Other rubber manufactures		56,878		38,828
Totals		\$133,629		\$359,242
Insulated wire		\$8,084		\$113,339
Fountain pens				8
Suspenders and garters		19,557		29,623
Rubber scrap	40,307	3,825	149,435	13,538

PORT OF NEW ORLEANS.

IMPORTS.			
UNMANUFACTURED—free:			
Chicle		3,267	\$2,641
EXPORTS.			
MANUFACTURED:			
Automobile tires		\$2,739	\$45,144
Inner tubes			16,690
Solid tires			3,572
All other tires		197	1,697
Belting		6,161	2,187
Hose			5,322
Packing			1,203
Rubber boots	72	61	306
Rubber shoes	15,207	10,648	24,756
Soles and heels			1,088
Druggists' sundries		1,296	84
Other rubber manufactures		1,006	6,624
Totals		\$22,108	\$108,673
Insulated wire		\$3,853	\$10,992
Fountain pens	68	197	60
Suspenders		4,646	23,178
Chewing gum		2,182	4,434

REEXPORTS.

Chicle		\$2,106	
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PORT OF SEATTLE.

IMPORTS.			
UNMANUFACTURED—free:			
Crude rubber:			
From Canada	920	\$314	307,004
Straits Settlements	1,388,873	597,430	1,119,661
British East Indies	82,880	31,152	154,140
Dutch East Indies	63,350	28,508	161,840
Hongkong			160
Japan	169,225	68,460	
Totals	1,705,248	\$725,864	1,580,965
Jelutong		12,667	\$1,061,031
Rubber scrap			144,000
Gutta percha	200	40	24,697
Rubber manufactures		250	46
EXPORTS.			
MANUFACTURED:			
Automobile tires		\$337,531	\$136,180
Inner tubes			18,446
Solid tires			1,417
All other tires		3,379	13,856
Belting		1,725	3,328
Hose			1,647
Packing			338
Rubber boots	1,014	1,912	3,267
Rubber shoes	2,246	2,281	137
Soles and heels			4,286
Druggists' sundries		2,504	561
Other rubber manufactures		9,370	2,337
Totals		\$358,702	\$185,800
Insulated wire		\$2,762	\$2,337
Fountain pens			257
Suspenders		5,547	213
Chewing gum		29	27
Reclaimed rubber	40,637	1,532	63,044

PORT OF SAN FRANCISCO.

IMPORTS.			
UNMANUFACTURED—free:			
Crude rubber:			
From Straits Settlements	2,953,494	\$1,070,386	1,650,023
China	857		\$791,134
Dutch East Indies	918,140	300,221	
Hong Kong	858	317	80
Totals	3,873,614	\$1,371,781	1,650,227
Jelutong			
Rubber scrap and reclaimed	57,000	\$3,437	
Rubber manufactures	9,146	326	\$622

PORT OF SAN FRANCISCO—Continued.

	EXPORTS.			
	June.		June.	
	1919.	1920.	1919.	1920.
	Pounds.	Value.	Pounds.	Value.
MANUFACTURED:				
Automobile tires.....		\$334,433		\$305,613
Inner tubes.....				65,064
Solid tires.....				18,721
All other tires.....		7,997		8,248
Belting.....		81,405		67,493
Hose.....				35,191
Packing.....				25,705
Rubber boots.....pairs	852	2,043	68	337
Rubber shoes.....pairs	5,231	8,284	9,427	8,871
Soles and heels.....				6,568
Druggists' sundries.....		6,598		1,752
Other rubber manufactures..		99,381		15,003
Totals.....		\$540,141		\$558,566
Insulated wire.....		\$8,649		\$14,424
Fountain pens.....number	180	452	252	690
Suspenders.....		6,564		1,734
Chewing gum.....		8,616		10,702
UNMANUFACTURED—free:				
Reclaimed and scrap rubber.	3,500	375	74,067	2,667

UNITED KINGDOM RUBBER STATISTICS.

	IMPORTS.			
	June.		June.	
	1919.	1920.	1919.	1920.
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—				
Crude rubber:				
From—				
Straits Settlements.....	5,494,400	£574,949	5,559,800	£609,286
Federated Malay States....	5,683,900	553,003	6,293,700	708,308
British India.....	661,300	62,933	1,703,600	191,797
Ceylon and dependencies....	3,208,500	324,497	2,597,500	283,437
Other Dutch possessions in Indian seas.....	1,389,600	135,273	1,084,900	122,756
Dutch East Indies (except other Dutch possessions in Indian seas).....	3,350,900	323,088	2,571,600	289,365
Other countries in the East Indies and Pacific not elsewhere specified.....	136,900	14,220	234,000	26,223
Brazil.....	1,248,800	128,582	2,025,000	195,240
Peru.....	235,200	21,000	160,000	15,200
South and Central America (except Brazil and Peru).....	1,900	170	47,900	5,011
West Africa:				
French West Africa.....	26,800	1,988	3,400	230
Gold Coast.....	47,700	3,711	15,900	1,726
Other parts of West Africa.....	61,100	6,181	163,200	24,989
East Africa (including Madagascar).....	5,800	610	94,700	9,547
Other countries.....	194,300	18,427	293,500	25,632
Totals.....	21,747,100	£2,168,632	22,848,700	£2,508,749
Waste and reclaimed rubber.	606,400	12,095	907,100	14,343
Totals, unmanufactured.....	22,353,500	£2,180,727	23,755,800	£2,523,092
Gutta percha and balata.....	516,800	111,262	1,482,000	333,677
Rubber substitutes.....			58,200	2,040
MANUFACTURED—				
Boots and shoes, dozen pairs.....	3,391	£5,477	47,584	£99,607
Waterproof clothing.....		275		611
Tires and tubes.....		109,366		500,220
Other rubber manufactures.....		45,389		47,726
Insulated wire.....				182

EXPORTS.

UNMANUFACTURED—				
Waste and reclaimed rubber.	1,610,200	£24,465	1,338,600	£35,063
*Rubber substitutes.....			168,100	9,225
Totals.....	1,610,200	£24,465	1,506,700	£44,288
MANUFACTURED—				
Boots and shoes, dozen pairs.....	11,747	£23,634	7,655	£17,194
Waterproof clothing.....		108,285		216,359
Insulated wire.....		96,028		140,762
Submarine cables.....		38,990		416,853
Tires and tubes.....		402,568		671,187
Other rubber manufactures..		247,155		431,224
Totals.....		£916,660		£1,963,579

EXPORTS—COLONIAL AND FOREIGN.

UNMANUFACTURED—				
Crude rubber:				
To Russia.....	*27,300	£4,060	10,300	£1,000
Sweden, Norway and Denmark.....	1,272,700	153,180	413,900	39,375
Germany.....	214,900	23,880	1,078,900	102,999
Belgium.....	67,334	757,700	516,000	63,104
France.....	2,255,700	246,093	2,842,900	310,716
Spain.....	71,000	8,260	45,400	4,744
Italy.....	1,137,000	123,953	370,500	38,834
Austria-Hungary.....			10,800	132,800
Other European countries.....	1,293,200	139,356	607,200	59,766
United States.....	1,164,700	109,830	5,021,600	574,185
Canada.....	367,500	46,916	1,478,400	167,076
Other countries.....	35,600	4,403	286,300	32,375
Totals, rubber.....	8,596,400	£927,265	12,682,200	£1,526,974
Waste and reclaimed rubber.	71,900	£3,340	17,900	£1,190
Gutta percha and balata.....	79,000	12,234	109,900	19,270
Rubber substitutes.....			6,900	160

	June.			
	1919.		1920.	
	Pounds.	Value.	Pounds.	Value.
MANUFACTURED—				
Boots and shoes, dozen pairs.....	76	192	793	4,636
Waterproofed clothing.....				16
Tires and tubes.....		13,022		40,376
Insulated wire.....		27		
Other manufactures.....		5,216		2,006
Totals, manufactured.....		£18,457		£47,034

*Included in "Other Articles," Class III and I, prior to 1920.

RUBBER STATISTICS FOR THE DOMINION OF CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	April.			
	1919.		1920.	
	Pounds.	Value.	Pounds.	Value.
UNMANUFACTURED—free:				
Rubber, gutta percha, etc.:				
From United Kingdom.....	69,454	\$20,053	403,302	\$256,326
United States.....	307,854	131,662	232,178	96,446
Belgian Congo.....	13,036	5,589		
Brazil.....			73,650	39,013
British East Indies:				
Ceylon.....	44,709	16,095	33,600	22,468
India.....			5,300	1,974
Straits Settlements.....	509,277	202,392	852,845	478,980
Other countries.....			15,616	9,641
Totals.....	944,330	\$375,791	1,616,491	\$904,848
Balata.....	19	\$28		
Rubber recovered.....	214,763	35,074	235,617	\$37,656
Rubber, powdered, and rubber or gutta percha scrap.....	183,562	20,051	200,831	7,355
Rubber substitutes.....	160,866	15,456	153,970	21,244
Totals unmanufactured.....	1,503,540	\$446,400	2,206,909	\$971,103
PARTLY MANUFACTURED—				
Hard rubber sheets and rods.....	6,254	\$4,057	4,952	\$2,878
Hard rubber tubes.....		2,124		1,859
Rubber thread, not covered..	940	1,402	4,240	6,373
Totals, partly manufactured.....	7,194	\$7,583	9,192	\$11,110
MANUFACTURED—				
Belting.....		\$11,734		\$16,275
Hose.....		7,746		6,243
Packing.....		5,085		7,131
Boots and shoes.....		13,813		59,178
Clothing, including waterproofed.....		15,851		25,061
Gloves.....		2,160		549
Hot water bottles.....		4,406		2,496
Tires, solid.....		12,234		20,835
Tires, pneumatic.....		66,251		149,214
Tires, inner tubes.....		8,979		7,532
Other manufactures.....		157,277		279,071
Totals, manufactured.....		\$305,536		\$573,585
Totals, rubber imports.....		\$1,135,310		\$2,460,646
Insulated wire and cables:				
Wire and cables covered with cotton, linen, silk, rubber, etc.....		\$14,600		\$11,078
Copper wire and cables, covered as above.....		5,677		11,981
Chicle.....	262,206	172,950		

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	April.			
	1919.		1920.	
	Produce of Canada. Value.	Reexports of Foreign Goods. Value.	Produce of Canada. Value.	Reexports of Foreign Goods. Value.
UNMANUFACTURED—				
Crude and waste rubber.....	\$187,586	\$127,618	\$4,828	\$16,765
MANUFACTURED—				
Belting.....	28	\$34	\$947	\$2,017
Hose.....		3,514		4,786
Boots and shoes.....		59,994		115,529
Clothing, including waterproofed.....		7,159		930
Tires, pneumatic.....		331,409		939,752
Tires, other kinds.....		1,877		440
Other manufactures.....		9,843		29,662
Totals, manufactured.....	\$28	\$413,830	\$947	\$1,093,116
Total rubber exports.....	\$187,614	\$541,448	\$5,775	\$1,109,881
Chicle.....	\$29,412	\$36,473		

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	January.			
	1919.		1920.	
UNMANUFACTURED—	Quintals. ¹	Lire. ²	Quintals.	Lire.
Crude rubber and gutta percha— raw and reclaimed:				
From British India and Ceylon	501		490	
Straits Settlements.....	668			
French African Colonies.....	754	2,367,750	152	1,431,150
Brazil.....	235		309	
Other countries.....	97		412	
Totals.....	2,255	2,367,750	1,363	1,431,150
Rubber scrap.....			11	1,980
Totals, unmanufactured..	2,255	2,367,750	1,374	1,433,130
MANUFACTURED—				
India rubber and gutta percha—				
Threads.....			13	33,800
Sheets, including hard rubber	71	113,600	1	700
Tubes.....	17	20,400	1	1,300
Belted.....	43	60,200	56	78,400
Rubber-coated fabrics..... ^{pieces}	23	36,800	14	22,000
Boots and shoes..... ^{pairs}	111	1,665	13,030	195,450
Elastic webbing.....			3	8,400
Clothing and articles for travel.			8	25,600
Tires and tubes:				
From France.....	490		2	
Great Britain.....		1,176,000	302	1,092,000
Other countries.....			151	
Other manufactures.....	2,541	3,717,300	275	404,700
Totals, manufactured.....		5,225,965		1,865,150
Total imports.....		7,593,715		3,298,280

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

January.

	1919.		1920.	
	Quintals. ¹	Lire. ²	Quintals.	Lire.
UNMANUFACTURED—				
India rubber and gutta percha— raw and reclaimed:				
To Spain.....	1,632		245	98,000
United States.....		652,800		
Totals.....	1,622	652,800	245	98,000
Waste.....			180	21,600
Totals.....	1,632	652,800	245	98,000
MANUFACTURED—				
India rubber and gutta percha—				
Threads.....	25	67,500	50	135,000
Sheets, including hard rubber.	3	4,200	50	63,600
Tubes.....	73	84,800	54	59,500
Belted.....	76	121,600		
Rubberized fabrics..... ^{pieces}			9	10,800
Elastic webbing.....	84	252,000	28	84,000
Clothing and articles for travel.			139	667,200
Tires:				
To Austria.....			9	
Belgium.....			3	
France.....	214			
Great Britain.....	31			
Spain.....			4	
Switzerland.....	1	1,837,300	69	174,800
Australia.....	241			
Argentina.....	171			
Brazil.....	175		1	
Other countries.....	13		6	
Totals.....	967	1,837,300	92	174,800
Other rubber goods.....	125	176,400	213	310,600
Totals, manufactured...		2,543,800		1,505,500
Total exports.....		3,196,600		1,625,100

¹One quintal equals 220.46 pounds.²One lira equals \$0.193 (normal).

EXPORTS OF INDIA RUBBER AND CAUCHO FROM MANAOS FOR SIX MONTHS ENDED JUNE 30, 1920.

EXPORTERS.	EUROPE.					NEW YORK.					GRAND	
	Fine.	Medium.	Coarse.	Cauchó.	TOTALS.	Fine.	Medium.	Coarse.	Cauchó.	TOTALS.	TOTALS.	TOTALS.
Tancredo, Porto & Co..... ^{kilos.}	843,599	49,187	82,246	77,121	1,052,153	289,376	132,222	269,237	648,061	1,338,896	2,391,049	
General Rubber Co. of Brazil...	713,935	66,071	45,211	13,403	838,620	596,402	104,184	178,189	385,755	1,264,530	2,103,150	
Stowell & Co.....	387,458	49,541	51,337	119,793	608,129	198,057	98,769	168,193	212,738	677,757	1,285,886	
Ohliger & Co.....	203,932				203,932	320,311	49,732	50,865	321,774	742,682	946,614	
Adelbert H. Alden, Limited....	167,638	6,758	1,121	579	176,096	340	5,041	35,160	14,110	54,651	230,747	
A. Souza.....						2,914	245	97,616	58,569	159,344	159,344	
J. A. Mendes & Co.....	71,075	98			71,173		13,692	20,225	50,165	84,082	155,255	
Higson & Fall.....	28,768	3,602	3,495	3,281	39,146	36,890	3,707	2,677	42,720	85,994	125,140	
B. Lévy & Co.....	47,498	6,077	53,244		106,819						106,819	
Morães, Carneiro & Co.....	14,436	2,291	2,228	2,198	21,153	32,086	4,798	1,965		38,849	60,002	
Amorim Irmãos.....	20,000				20,000	6,240	8,575	14,608	574	29,997	49,997	
Semper & Co.....	29,541	4,038	4,422		38,001	3,345	640	1,080	420	5,485	43,486	
J. G. Araujo.....	17,523	6,311	4,298	8,644	36,776						36,776	
Gomes & Co.....	23,290	320	600		24,210						24,210	
G. Deffner & Co.....						9,333		2,245	3,156	14,734	14,734	
J. Essabá.....	13,100	533	302		13,935						13,935	
Madeira-Mamoré Railway Co....	9,500				9,500						9,500	
Th. Lévy, Camille & Co. }	3,220	320	2,989	52	6,581						6,581	
Paulo Lévy & Co. }												
Oscar Ramos.....	3,530		2,550	425	6,505						6,505	
Archer Pinto & Co.....						1,571	116	1,327	46	3,060	3,060	
Vianna Lyra & Co.....						960				960	960	
Corrêa & Irmãos.....						100				100	100	
Totals..... ^{kilos.}	2,598,043	195,147	254,043	225,496	3,272,729	1,497,925	421,721	843,387	1,738,088	4,501,121	7,773,850	
In transit, Iquitos.....	10,158	3,660	2,391	2,752	18,961	160,557	465,881	77,881	266,072	970,391	989,352	
Totals..... ^{kilos.}	2,608,201	198,807	256,434	228,248	3,291,690	1,658,482	887,602	921,268	2,004,160	5,471,512	8,763,202	

(Compiled by Stowell & Co., Manaus, Brazil.)

EXPORTS OF INDIA RUBBER FROM MANAOS DURING JUNE, 1920.

EXPORTERS.	EUROPE.					NEW YORK.					GRAND	
	Fine.	Medium.	Coarse.	Cauchó.	TOTALS.	Fine.	Medium.	Coarse.	Cauchó.	TOTALS.	TOTALS.	TOTALS.
General Rubber Co. of Brazil..... ^{kilos.}	317,000	26,000	15,827	173	359,000	100,754	24,746	27,500	123,350	276,350	635,350	
Stowell & Co.....	107,450	28,508	11,989	54,311	202,258		16,729	5,584	97,514	119,827	322,085	
Tancredo, Porto & Co.....	6,120	2,720	7,611	3,520	19,971	88,681	16,129	15,316	86,826	206,952	226,923	
Ohliger & Co.....						26,750	1,573	2,042	39,293	69,658	69,658	
Higson & Fall.....						21,485	1,595	435	28,870	52,385	52,385	
Y. G. Araujo.....	1,970	4,409	1,863	7,867	16,109						16,109	
Morães, Carneiro & Co.....	2,132	534	939	1,440	5,045						5,045	
Amorim Irmãos.....						2,080		2,880		4,960	4,960	
Totals..... ^{kilos.}	434,672	62,171	38,229	67,311	602,383	239,750	60,772	53,757	375,853	730,132	1,332,515	
In transit, Iquitos.....		1,358			1,358	8,455	28,697	2,776	41,226	81,154	82,512	
Totals..... ^{kilos.}	434,672	63,529	38,229	67,311	603,741	248,205	89,469	56,533	417,079	811,286	1,415,027	

(Compiled by Stowell & Co., Manaus, Brazil.)

	Scrap and Old.		Reclaimed.		Belting, Hose, and Packing.		Boots.		Shoes.		Druggists' Rubber Sundries.		Automobile Tires.		All Other Man-Made Sources of Rubber.		Totals.
	Pounds.	Value.	Pounds.	Value.	Pairs.	Value.	Pairs.	Value.	Pairs.	Value.	Value.	Value.	Casings.	All Other.	Value.	Value.	
OCEANIA:																	
Australia.....
New Zealand.....
Other Brit. Oceania.....
French Oceania.....
German Oceania.....
Philippine Islands.....
TOTALS, OCEANIA.....
ASIA:																	
Aden.....
China.....
Chinese China.....
British India.....
Straits Settlements.....
Other British East Indies.....
Dutch East Indies.....
French East Indies.....
Hongkong.....
Japan.....
India.....
Java.....
Siam.....
Turkey in Asia.....
TOTALS, ASIA.....
AFRICA:																	
Belgian Congo.....
British West Africa.....
British South Africa.....
British East Africa.....
Cape.....
French Africa.....
German Africa.....
Italian Africa.....
Liberia.....
Morocco.....
Portuguese Africa.....
Egypt.....
TOTALS, AFRICA.....
Calendar year, 1919.....
Calendar year, 1918.....
Calendar year, 1917.....
Fiscal year, 1916-17.....
Fiscal year, 1915-16.....
Fiscal year, 1914-15.....
Fiscal year, 1913-14.....
Fiscal year, 1912-13.....
EUROPE:																	
Fiscal year, 1911-12.....
Fiscal year, 1910-11.....
Fiscal year, 1909-10.....
Fiscal year, 1908-09.....
Fiscal year, 1907-08.....
Fiscal year, 1906-07.....
Fiscal year, 1905-06.....
Fiscal year, 1904-05.....
Fiscal year, 1903-04.....
Fiscal year, 1902-03.....
Fiscal year, 1901-02.....
Fiscal year, 1900-01.....

a Not officially reported. bStates separately after 1912. Tires were not specifically reported before 1910-11. cDruggists' rubber sundries were not specifically reported before 1917-18. dThese figures are given for the calendar year ended December 31, 1918. eended June 30, 1918.
(Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.)

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF JUNE, 1920.

[illegible]

EXPORTED TO—

ASIA:	Belting.	Hose.	Packing.	Boots.	Shoes.	Sales and	Casings.	Inner.	Automobile Tires.	All	Insulated	Druggists'	All Other	Total.
Value.	Value.	Value.	Value.	Value.	Value.	Value.	Value.	Value.	Value.	Value.	Value.	Value.	Value.	Value.
Aden	\$4,849	\$2,476	\$4,433	.....	.....	.....	.....	\$130	\$1,074	\$2,664	\$2,769	\$2,196	\$6,258	\$130
China	17,698	.....	.....	.....	.....	.....	4,330
India	1,650	.....	.....	.....	.....	.....	4,330
British Settlements	66,127	.....	.....	.....	.....	.....	169,054
Straits Settlements	140,385	.....	.....	.....	.....	.....	159,860
Other British East Indies	127,454	.....	.....	.....	.....	.....	1,909
Dutch East Indies	6,666	.....	.....	.....	.....	.....	183,273
French East Indies	24,375	.....	.....	.....	.....	.....	7,150
Hongkong	307	.....	.....	.....	.....	.....	1,150
Japan	1,200	.....	.....	.....	.....	.....	1,150
Persia	17,589	.....	.....	.....	.....	.....	1,150
Russia in Asia	1,859	.....	.....	.....	.....	.....	1,150
Turkey in Asia	1,000	.....	.....	.....	.....	.....	1,150
TOTALS, ASIA	\$32,199	\$26,593	\$21,533	595	64,026	\$1,853	\$379,812	\$30,678	\$36,563	\$4,109	\$73,068	\$10,543	\$38,084	\$728,753
AFRICA:
Belgian Congo	\$531
British West Africa	103,339
British South Africa	211,207
British East Africa	17,980
French West Africa	2,513
French East Africa	1,045
Portuguese Africa	1,045
Egypt	1,045
TOTALS, AFRICA	\$31,466	\$9,738	\$1,855	.....	6,524	\$5,847	\$169,717	\$31,355	\$39,913	\$6,606	\$4,615	\$2,946	\$36,535	\$349,600
GRAND TOTALS	\$289,271	\$225,026	\$104,615	15,744	\$57,020	\$74,309	\$3,186,857	\$474,240	\$283,248	\$75,277	\$593,370	\$129,485	\$852,894	\$7,066,296

Belting, Hose and Packing Materials	Boots and Shoes.		Tires.		Insulated Wire and Cables.	All Other Sundries. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
	Pairs.	Value.	Automobile. Value.	Others. Value.				
Hawaii	10,456	8,149	.....	.....	.....	\$23,485
Porto Rico	66,068	8,149	.....	.....	.....	\$74,217
TOTALS	\$167,493	\$14,298	.....	.....	.....	\$311,363

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	1919.	1920.
June.		
Unmanufactured—free:		
India rubber:		
From France .....	.....	275,975
Netherlands .....	.....	1,928,772
Portugal .....	.....	598,664
United Kingdom	3,288,020	5,660,375
Canada	15,159	307,781
Central America	61,893	15,331
Mexico	133,258	30,721
Brazil	3,138,771	854,559
Peru	87,934	30,046
Other South Am.	131,229	124,998
British E. Indies	25,659,290	26,265,065
Dutch E. Indies	3,771,844	5,855,954
Other countries	345,083	220,606
Totals	36,632,481	43,538,723
Manufactured—dutiable:		
India rubber:		
From France	89,758	141,683
Netherlands	872,646	224,982
Portugal	209,523	39,327
United Kingdom	2,353,411	2,020,096
Canada	608,309	645,880
Central America	1,030,894	1,145,902
Mexico .....	.....	.....
Brazil .....	.....	.....
Peru .....	.....	.....
Other South Am. .....	.....	.....
British E. Indies .....	.....	.....
Dutch E. Indies .....	.....	.....
Other countries .....	.....	.....
Totals	14,587,499	15,398,578
Chicle (dutiable)	689,161	1,413,125
India rubber and gutta percha .....	.....	.....
India rubber substitutes	12,134	464
Totals, unmanufactured	41,587,499	46,899,266
Totals, manufactured	14,587,499	15,398,578
Totals	56,174,998	62,297,844

EXPORTS OF DOMESTIC MERCHANDISE.

Manufactured—	1919.	1920.
India rubber:		
Reclaimed and old	473,282	736,559
Belting	500,175	488,899
Hose .....	.....	.....
Packing .....	.....	.....
Boots	29,356	15,744
Shoes	528,651	749,154
Soles and heels .....	.....	.....
Tires:		
For automobiles .....	.....	.....
Casings .....	.....	.....
Inner tubes .....	.....	.....
Solid tires .....	.....	.....
All other tires	259,014	75,277
Druggists' rubber sundries	146,461	129,485
Suspenders and garters	318,251	449,264
Other rubber manufactures	889,151	852,894
Totals, manufactured	\$6,046,087	\$7,064,650
Fountain pens	66,331	51,132
Insulated wire and cables	1,420,699	593,370

EXPORTS OF FOREIGN MERCHANDISE.

Unmanufactured—	1919.	1920.
India rubber	379,635	432,906
Latex	22,335	9,743
Guayule .....	.....	50
Jelutong (Pontianak) .....	.....	53,071
Rubber scrap .....	.....	234
Totals, unmanufactured	\$177,787	\$174,646
Manufactured—		
Gutta percha .....	.....	.....
Totals, manufactured .....	.....	.....
India rubber substitutes	50	131
Chicle	33,799	2,893
Totals .....	.....	.....

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

Manufactured—	1919.	1920.
To Alaska:		
Belting, hose and packing .....	.....	.....
Boots and shoes	6,766	4,454
Other rubber goods	5,109	5,165
Totals	\$36,101	\$29,024
To Hawaii:		
Belting, hose and packing .....	.....	.....
Automobile tires	15,398	14,789
Other tires	63,065	101,425
Other rubber	5,841	6,056
Totals	\$103,776	\$141,739
To Porto Rico:		
Belting, hose and packing .....	.....	.....
Automobile tires	4,707	5,693
Other tires	66,343	66,068
Other rubber goods	3,182	8,149
Totals	15,766	17,968
Totals	\$89,998	\$97,878
To Philippine Islands—treated as foreign commerce .....	.....	.....

*Details of exports of domestic merchandise by countries during June, 1920, are given on pages 856-857 of this issue.

UNITED STATES CRUDE RUBBER IMPORTS FOR 1920 (BY MONTHS).

1920.	Plantations.	Parás.	Africanas.	Centrals.	Guayule.	Manicoba and Matto Grosso.	Balata.	Miscellaneous Gum.	Waste.	Totals.	
										1920.	1919.
January	17,799	2,620	821	111	...	...	...	...	...	21,351	7,235
February	29,681	2,456	558	265	...	...	...	...	...	32,994	17,456
March	28,533	2,463	514	23	114	...	113	983	1,252	33,998	28,223
April	21,036	1,893	628	29	79	10	22	812	448	24,957	28,146
May	24,443	2,025	662	95	113	...	45	1,059	224	28,666	97,410
June	12,911	1,352	427	27	164	...	7	552	164	15,604	16,319
July	14,695	1,115	34	40	...	...	8	1,283	312	17,487	17,965
Totals	149,098	13,924	31,644	590	504	13	195	4,689	2,400	175,057	212,754

(Compiled by The Rubber Association of America, Inc.)

THE MARKET FOR RUBBER SCRAP.

NEW YORK.

THE INACTIVITY that has featured in the rubber scrap market is fundamentally due to the general curtailment of tire production and a consequent stagnation in crude rubber. Reclaimers appear to be well stocked with scrap and are not interested as customary at this time in Fall deliveries. Dealers have shown little interest in present prices that are all practically nominal quotations.

BOOTS AND SHOES. All grades are from $\frac{1}{4}$ to $\frac{1}{2}$ cent lower than last month, depending on the willingness of the seller to make concessions. An average price for boots and shoes, delivered, is around 6.25 cents.

INNER TUBES. These have declined about $\frac{1}{2}$ to 1 cent throughout the list, since a month ago. Holders have asked 14 to 14 $\frac{1}{2}$ cents for No. 1 tubes, delivered.

TIRES. Prices are from $\frac{1}{4}$ to $\frac{1}{2}$ cent lower than last month, standard auto tires being quoted around 2 $\frac{1}{2}$ to 3 cents, delivered.

There has been very little interest shown in the other sorts, mechanicals being particularly lifeless.

QUOTATIONS FOR CARLOAD LOTS DELIVERED.

AUGUST 26, 1920.

Prices subject to change without notice.

BOOTS AND SHOES:

Arctic tops	lb.	\$0.075 @	
Boots and shoes	lb.	.06 $\frac{1}{2}$ @	.06 $\frac{3}{4}$
Trimmed arctics	lb.	.05 $\frac{1}{4}$ @	.05 $\frac{3}{4}$
Untrimmed arctics	lb.	.04 $\frac{3}{4}$ @	.04 $\frac{3}{4}$

HARD RUBBER:

Battery jars, black compound	lb.	.01 @	.01 $\frac{1}{4}$
No. 1, bright fracture	lb.	.23 @	.24

INNER TUBES:

No. 1	lb.	.14 $\frac{1}{2}$ @	.15
Compounded	lb.	.08 $\frac{1}{2}$ @	.09
Red	lb.	.07 @	.07 $\frac{1}{2}$

MECHANICALS:

Black scrap, mixed, No. 1	lb.	.03 $\frac{1}{2}$ @	.04
No. 2	lb.	.02 $\frac{1}{2}$ @	.02 $\frac{3}{4}$
Car springs	lb.	.03 $\frac{1}{2}$ @	.04
Heels	lb.	.03 @	.03 $\frac{1}{2}$
Horse-shoe pads	lb.	.03 @	.03 $\frac{1}{2}$
Hose, air brake	lb.	.03 $\frac{1}{2}$ @	.03 $\frac{3}{4}$
fire, cotton lined	lb.	.01 $\frac{1}{2}$ @	.01 $\frac{3}{4}$
garden	lb.	.01 $\frac{1}{2}$ @	.01 $\frac{3}{4}$
Insulated wire stripping, free from fiber	lb.	.03 $\frac{1}{2}$ @	.04
Matting	lb.	.01 $\frac{1}{4}$ @	.01 $\frac{1}{2}$
Red packing	lb.	.05 $\frac{1}{4}$ @	.06
Red scrap, No. 1	lb.	.09 @	.10
No. 2	lb.	.06 $\frac{1}{4}$ @	.07 $\frac{1}{4}$
White scrap	lb.	.08 @	.09
No. 1	lb.	.10 @	.11

TIRES:

PNEUMATIC—

Auto peelings	lb.	.03 $\frac{3}{4}$ @	.04 $\frac{1}{4}$
Bicycle	lb.	.02 $\frac{1}{4}$ @	.02 $\frac{3}{4}$
Standard white auto	lb.	.03 $\frac{3}{4}$ @	.04 $\frac{1}{4}$
Standard auto	lb.	.02 $\frac{1}{4}$ @	.03
Stripped, unguaranteed	lb.	.01 $\frac{3}{4}$ @	.02 $\frac{1}{4}$
White, G. & G., M. & W., and U. S.	lb.	.04 $\frac{1}{4}$ @	.04 $\frac{3}{4}$

SOLID—

Carriage	lb.	.04 @	.04 $\frac{1}{4}$
Irony	lb.	.01 @	
Truck	lb.	.03 $\frac{1}{2}$ @	.03 $\frac{3}{4}$

THE MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

AMERICAN COTTON has shown a steady decline during August that was due to the excellent prospects for an increased crop, together with the uncertainty regarding consumption, as rumors of manufacturing curtailment were persistent.

From 40 cents quoted on August 2 for middling uplands spot cotton, the market slowly declined to 32.50 cents, the quotations on August 23. Quiet conditions prevailed until the close of the month, with spot quotations around 32 cents for middling uplands.

The Acting Secretary of Agriculture on July 21 signed the pink boll-worm quarantine order, applicable to Louisiana and Texas. It is effective August 1.

ARIZONA COTTON. As this is the period between crops, very little can be reported until the market for the new crop opens. Tentative quotations on the new staple are placed at 80 to 90 cents.

EGYPTIAN COTTON. A bumper crop is expected. The official acreage this season for Egyptian cotton is 1,827,888 feddans. This shows an increase of 254,226 feddans over the acreage in 1919, and is the largest ever planted in Egypt, the previous record being 1,755,270 feddans in 1914. One feddan equals 1,038 acres. The record of the past eight years, including 1920, is as follows:

1920	1,827,888	1916	1,655,512
1919	1,573,662	1915	1,186,003
1918	1,315,572	1914	1,755,270
1917	1,677,308	1913	1,723,094

Quotations on August 23 were 90 cents to \$1 on Sakellarides, and 60 to 70 cents for uppers.

COTTON FABRICS. The market for all cotton fabrics used by the rubber trade is practically dead. Cotton goods can not be sold in quantities, even at reduced prices, because of unsettled market conditions. Fabric mills have caught up on orders and are looking for business, but the rubber trade is not interested in buying cotton goods at this time; in fact, many manufacturers are offering to sell surplus stocks. The following prices are largely nominal.

NEW YORK QUOTATIONS.

August 26, 1920.

Prices subject to change without notice.

ASBESTOS CLOTH:

Brake lining, 2 $\frac{1}{2}$ lbs. sq. yd., brass or copper insertion	lb.	*\$1.00 @	1.10
2 $\frac{1}{2}$ lbs. sq. yd., brass or copper insertion	lb.	*1.10 @	1.15

BURLAPS:

32—7-ounce	103 yards	@	
32—8-ounce		@	
40—7 $\frac{1}{2}$ -ounce		9.00 @	
40—8-ounce		9.25 @	
40—10-ounce		12.00 @	
40—10 $\frac{1}{2}$ -ounce		12.25 @	
45—7 $\frac{1}{2}$ -ounce		@	
45—8-ounce		@	
48—10-ounce		@	

DRILLS:

38-inch 2.00-yard	yard	*.42 $\frac{1}{2}$ @	
40-inch 2.47-yard		*.36 $\frac{1}{2}$ @	
52-inch 1.90-yard		*.52 $\frac{3}{4}$ @	
52-inch 1.95-yard		*.51 $\frac{3}{4}$ @	
60-inch 1.52-yard		*.65 $\frac{1}{2}$ @	

DUCK:**CARRIAGE CLOTH:**

38-inch 2.00 yard enameling duck.....yard	*\$0.42½ @
38-inch 1.74-yard.....	*.48½ @
72-inch 16.66-ounce.....	*1.20 @
72-inch 17.21-ounce.....	*1.24 @

MECHANICAL:

Hose.....pound	*.78 @ .82
Belting.....	*.78 @ .82

HOLLANDS, 40-INCH:

Acme.....yard	@
Endurance.....	@
Penn.....	@

OSNABURGS:

40-inch 2.35-yard.....yard	@
40-inch 2.48-yard.....	@
37½-inch 2.42-yard.....	@

RAINCOAT FABRICS:**COTTON:**

Bombazine 64 x 60.....yard	*.30 @
60 x 48.....	*.27 @
Cashmeres, cotton and wool, 36-inch, tan.....	*.95 @
Twills 64 x 72.....	*.46 @
64 x 102.....	*.48 @
Twill, mercerized, 36-inch, blue and black.....	.45 @
tan and olive.....	.42½ @
Tweed.....	*.60 @ 1.40
printed.....	*.27½ @
Plaids 60 x 48.....	*.28 @
56 x 44.....	*.27 @
Repp.....	*.27 @ .45
Prints 60 x 48.....	*.29 @
64 x 60.....	*.32 @

IMPORTED WOOLEN FABRICS SPECIALLY PREPARED**FOR RUBBERIZING—PLAIN AND FANCIES:**

63-inch, 3¼ to 7½ ounces.....yard	1.00 @ 2.50
36-inch, 2¼ to 5 ounces.....	.77 @ 2.04

IMPORTED PLAID LINING (UNION AND COTTON):

63-inch, 2 to 4 ounces.....yard	.86 @ 1.71
36-inch, 2 to 4 ounces.....	.54 @ 1.04

DOMESTIC WORSTED FABRICS:

36-inch, 4¼ to 8 ounces.....yard	.77 @ 1.71
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DOMESTIC WOVEN AND PLAID LININGS (COTTON):

36-inch, 3¼ to 5 ounces.....	.24 @ .32
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SHEETINGS, 40-INCH:

48 x 48, 2.35-yard.....yard	.24½ @
48 x 48, 2.50-yard.....	.23 @
48 x 48, 2.85-yard.....	.19 @
64 x 68, 3.15-yard.....	.26 @
56 x 60, 3.60-yard.....	.19 @
48 x 44, 3.75-yard.....	.17½ @

SILKS:

Canton, 38-inch.....yard	.48½ @
Schappe, 36-inch.....	.75 @

STOCKINETTES:**SINGLE THREAD:**

3½ Peeler, carded.....pound	*1.15 @ 1.15½
4½ Peeler, carded.....	*1.80 @
6½ Peeler, combed.....	@

DOUBLE THREAD:

Zero Peeler, carded.....pound	*.98 @ .98½
3½ Peeler, carded.....	*1.04 @ 1.04½
6½ Peeler, combed.....	*2.70¼ @ 2.70½

TIRE FABRICS:**BUILDING:**

17¼-ounce Sakellarides, combed.....pound	*2.35 @
17¼-ounce Egyptian, combed.....	*2.15 @
17¼-ounce Egyptian, carded.....	*2.05 @
17¼-ounce Peelers, combed.....	*2.25 @
17¼-ounce Peelers, carded.....	*1.47 @

CORD:

15-ounce Egyptian.....pound	*2.40 @
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BICYCLE:

8-ounce American.....pound	*1.50 @
10-ounce American.....	*1.48 @

CHAFFER:

9¼-ounces Sea Island.....pound	@
9¼-ounce Egyptian, carded.....	*2.29 @
9¼-ounce Peeler, carded.....	*1.71 @

*Nominal.

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.**NEW YORK.**

THE DEMAND for rubber compounding pigments combined with that of the paint manufacturing industry has stimulated an increase of production in all of the principal lines. This increase is expected to continue for another year. The shortage in the supply of barytes is being sharply felt since it has seriously limited the production of such products as floated barytes, blanc fixe and lithopone, all of which are important in both the rubber and paint industries. Both the United States and Canada are being thoroughly searched for new workable deposits of crude barytes as a basis for future increased output. The present shortage is being relieved in a small degree by importations of

German crude. Labor and transportation difficulties are gradually disappearing from the situation.

Regarding supplies in general, the present weakness of the market is due to accumulation of stocks in the hands of sellers and the lack of money to carry over this temporary period. The importing or manufacturing of any of these chemicals has not declined, and in many cases higher prices are being asked for later and future shipments by the manufacturers, as reflecting the real cost to produce these items.

ANILINE. The demand for aniline oil has decreased considerably. Spot stock declined steadily in price several cents during the month and was weak at 31 cents.

BARYTES. There has been no change in the general barytes situation. Facilities for production are overtaxed and output is hampered by labor and transportation difficulties. There will be a scarcity for some time affecting the lithopone and blanc fixe markets.

BENZOL. The market is very firm. Producers are sold up on contracts at 33 cents per gallon for 90 per cent and 35 cents for the pure grade. Export demand is reported to be heavy.

BLACKS. The manufacturers are operating at full capacity and the demand is sufficient to absorb all the production. There has been a reduction in the contract price of carbon black from 15 cents to 12 cents.

CHINA CLAY. This material is in good demand at steady prices. Imports are not heavy and are quickly absorbed.

TIRE FABRICS

JENCKES SPINNING COMPANY

PAWTUCKET RHODE ISLAND

AKRON OFFICE
407 Peoples Savings & Trust
Co. Building.

CARBON BISULPHIDE. Production is fully taken and the price remains firm at 8½ cents.

CARBON TETRACHLORIDE. The market has held strong the entire month with a moderate and distinct advance in price to about 14½ cents spot.

DRY COLORS. The demand has been active and prices steady, especially in Spanish red oxide and ultramarine.

LITHARGE. The demand has been good and prices steady at 11¼ to 12½ cents. Consumption has been above normal.

LITHOPONE. Manufacturers are doing all they are able to meet the demand and make up the shortage. Next year will bring a decided increase in production with the starting up of new plants now under construction. Limited amounts are arriving from Belgium.

SUBLIMED LEAD. Consumption is heavy and production steady, although there are delays in delivery. Poor rail transportation service is a strong market factor and the price of 10 to 10½ cents will probably hold for some time.

SULPHUR. Price and demand have continued steady.

SOLVENT NAPHTHA. Supplies are scarce and firm at 30 cents a gallon in carload lots.

WHITING. Producers are unable to meet the demand. No reduction in price is probable until the short supply is remedied.

ZINC OXIDE. Producers are sold up. The industry is still expanding. The demand is fully up to production and is liable to continue so for some time. Imports of zinc oxide are not arriving in large amounts. Prices remain unchanged.

NEW YORK QUOTATIONS.

August 26, 1920.

Prices subject to change without notice.

ACCELERATORS, ORGANIC.

Accelerene (New York).....lb.	\$4.75 @	
Accelamal.....lb.	.60 @	.65
Aldehyde ammonia crystals.....lb.	2.70 @	3.25
Aniline oil.....lb.	.33 @	.34
Excellerex.....lb.	.70 @	.75
Hexamethylene tetramine (powdered).....lb.	2.70 @	3.25
N. C. C.....lb.	.50 @	
No. 999.....lb.	.20 @	
Paraphenylenediamine.....lb.	2.70 @	2.85
Thiocarbamide.....lb.	.55 @	.60
Velocan.....lb.	3.70 @	
Vul-Ko-Cene.....lb.	.35 @	
Virol.....lb.	.80 @	

ACCELERATORS, INORGANIC.

Lead, dry red (bbis.).....lb.	.12½ @	
sublimed blue (bbis.).....lb.	.10 @	
sublimed white (bbis.).....lb.	.10 @	
white, basic carbonate (bbis.).....lb.	.10½ @	
Lime, flour.....lb.	.62 @	
Litharge, domestic.....lb.	1.11½ @	.15
imported.....lb.	.17 @	
sublimed.....lb.	.12 @	
Magnesium, carbonate, light.....lb.	.12½ @	
calcined extra light.....lb.	.60 @	
calcined light.....lb.	.35 @	
calcined medium light.....lb.	.30 @	
calcined heavy.....lb.	.07½ @	.09
calcined commercial (magnesite).....lb.	.04 @	
oxide, extra light.....lb.	.22 @	
light technical.....lb.	.38 @	
light, imported.....lb.	.55 @	
imported.....lb.	.35 @	

ACIDS.

Acetic, 28 per cent (bbis.).....cwt.	3.75 @	4.50
glacial, 99 per cent (carboys).....cwt.	15.95 @	16.70
Cresylic (97% straw color) (drums).....gal.	1.20 @	1.30
(95% dark) (drums).....gal.	1.10 @	1.20
Muriatic, 20 degrees.....cwt.	2.25 @	2.50
Nitric, 36 degrees.....cwt.	6.25 @	6.50
Sulphuric, 66 degrees.....ton	22.00 @	24.00

ALKALIES.

Caustic soda, 76 per cent (bbis.).....lb.	.06½ @	.07½
Soda ash (bbis.).....lb.	.05 @	

COLORS.

Black:		
Bone, powdered.....lb.	.06 @	
granulated.....lb.	.11 @	
Carbon black (sacks, factory).....lb.	.15 @	.25
pressed.....lb.	.20 @	
Drop.....lb.	.05½ @	.13
Ivory black.....lb.	.16 @	.30
lampblack.....lb.	.12 @	.45
soluble aniline.....lb.	1.00 @	
Rubber black.....lb.	.09½ @	

Blue:

Cobalt.....lb.	\$0.25 @	\$0.35
Prussian.....lb.	1.00 @	
Ultramarine.....lb.	.18 @	.50
Rubber makers' blue.....lb.	3.50 @	

Brown:

Iron oxide.....lb.	.04 @	.04½
Sienna, Italian, raw and burnt.....lb.	.05 @	.15
Umber, Turkey, raw and burnt.....lb.	.06 @	.10
Vandyke.....lb.	.08 @	.10
Maroon oxide.....lb.	.15 @	

Green:

Chrome, light.....lb.	.42 @	.70
medium.....lb.	.42 @	.70
dark.....lb.	.50 @	.70
commercial.....lb.	.07 @	.15
tile.....lb.	.20 @	
Oxide I. R.....lb.	.85 @	
Oxide of chromium (casks).....lb.	.74 @	1.25
Rubber makers' green.....lb.	3.50 @	

Red:

Antimony, crimson, sulphuret of (casks).....lb.	.45 @	
crimson, "Mephisto" (casks).....lb.	.60 @	
crimson, "R. M. P.".....lb.	.65 @	
Antimony, golden sulphuret of (casks).....lb.	.20 @	.22
golden sulphuret (States).....lb.	.35 @	.40
golden, "Mephisto" (casks).....lb.	.33 @	
golden, "R. M. P.".....lb.	.33 @	
red sulphuret (States).....lb.	.25 @	.30
vermillion sulphuret.....lb.	.55 @	
Arsenic, red sulphide.....lb.	.18 @	
Indian.....lb.	.14 @	
Para toner.....lb.	2.25 @	
Red excelsior.....lb.	.19 @	.22
Toluidine toner.....lb.	4.25 @	
Iron oxide, reduced grades.....lb.	.06 @	.12
pure bright.....lb.	.15 @	.17
Spanish neutral.....lb.	.05½ @	.06½
Venetian.....lb.	.02½ @	
Oil soluble aniline, red.....lb.	1.75 @	2.00
orange.....lb.	1.65 @	
Oximony.....lb.	.18 @	
Vermilion, American.....lb.	.25 @	.30
permanent.....lb.	.37 @	
English quicksilver.....lb.	1.55 @	1.75
Rubber makers' red.....lb.	3.50 @	4.00
purple.....lb.	2.50 @	

White:

Albalith.....lb.	.07½ @	.08½
Aluminum bronze, extra brilliant.....lb.	.65 @	
extra fine.....lb.	.75 @	
Lithopone, domestic.....lb.	.07½ @	.08½
Ponolith (carloads, factory).....lb.	.11½ @	
Rubber-makers' white.....lb.	.11½ @	
Zinc oxide, American (factory):		
Special.....lb.	.10½ @	.11
XX red.....lb.	.10 @	.10½
French process (factory):		
White seal.....lb.	.13½ @	.13½
Green seal.....lb.	.12½ @	.12½
Red seal.....lb.	.11½ @	.11½
Azo factory:		
ZZZ (lead free).....lb.	.10 @	.10½
ZZ (under 5% lead).....lb.	.09 @	.09½
Z (8-10% lead).....lb.	.08½ @	.08½

Yellow:

Cadmium, sulphide, yellow, light, orange.....lb.	2.10 @	
red.....lb.	2.10 @	
Chrome, light and medium.....lb.	.35 @	
Ochre, domestic.....lb.	.04 @	.05
imported.....lb.	.05½ @	.06½
Oil, soluble aniline.....lb.	1.75 @	
Rubber makers' yellow.....lb.	2.50 @	3.50
Zinc chromate.....lb.	.50 @	

COMPOUNDING INGREDIENTS.

Aluminum flake (carload).....ton	45.00 @	35.00
silicate.....ton	26.00 @	
Ammonium carbonate (powdered).....lb.	.17½ @	
Asbestine (carloads).....ton	27.00 @	
Barium, carbonate, precipitated.....lb.	100.00 @	
sulphide, precipitated.....lb.	.05 @	
dust.....ton	110.00 @	
Barytes, pure white (f. o. b. works).....ton	28.00 @	
off color.....ton	20.00 @	
uniform floated.....ton	28.00 @	
Basofor.....lb.	.06½ @	
Blanc fixe (dry, bbis.).....lb.	.06 @	
Bone ash.....lb.	.10 @	
Carrara filler.....lb.	.02 @	.04
Chalk, precipitated, extra light.....lb.	.05 @	.05½
heavy.....lb.	.04 @	.04½
China clay, Dixie.....ton	22.00 @	
Blue Ridge.....ton	22.00 @	
domestic.....ton	10.00 @	20.00
imported.....ton	19.00 @	24.00
Shawnee.....ton	20.00 @	
Cotton linters, clean mill run, f. o. b. factory.....lb.	.03 @	.04
Fossil flour (powdered).....ton	60.00 @	
(bolted).....ton	65.00 @	
Diatomite.....lb.	.03 @	.04
Glue, high grade.....lb.	.35 @	.45
medium.....lb.	.30 @	.35
low grade.....lb.	.20 @	.25
Graphite, flake (400-pound bbl.).....lb.	.10 @	.30
amorphous.....lb.	.05 @	.05
Ground glass FF. (bbis.).....lb.	.03 @	

Infusorial earth (powdered).....	ton	\$60.00	@
(bolted).....	ton	65.00	@
Liquid rubber	lb.	.18	@
Mica, powdered	lb.	.15	@
Pumice stone, powdered (bb'l.).....	lb.	.05	@ .10
Rotten stone, powdered	lb.	.02½	@ .04½
Rubber paste	lb.	.19	@ .22
Silica, gold bond.....	ton	40.00	@
silver bond	ton	28.00	@
Soapstone, powdered gray (carload).....	ton	12.00	@
Sarch, powdered	cwt.	6.52	@ 5.19
Talc, powdered soapstone.....	ton	18.00	@ 20.00
Terra blanche	ton	25.00	@ 30.00
Tripoli earth, air-floated, cream or rose (factory).....	ton	50.00	@
white (factory)	ton	52.50	@
Tyre-lith	ton	130.00	@
Whiting, Alba (carloads).....	cwt.	1.00	@
Columbia	cwt.	1.00	@
commercial	cwt.	1.40	@
Danish	ton	24.00	@
English cliffstone.....	cwt.	2.00	@
gilders	cwt.	1.45	@ 1.55
Paris, white, American.....	ton	30.00	@
Quaker	ton	16.00	@
Super	ton	30.00	@ 32.50
Wood pulp, imported	ton	65.00	@ .03½
XX	ton	60.00	@
X	ton	50.00	@
Wood flour, American.....	ton	50.00	@

MINERAL RUBBER

Elatenor (c. l. factory).....	ton	60.00	@
(l. c. l. factory).....	ton	63.00	@
Gilsonite.....	ton	75.00	@
Genasco (c. l. factory).....	ton	67.50	@
(l. c. l. factory).....	ton	69.50	@
Hard hydrocarbon.....	ton	42.00	@
Soft hydrocarbon.....	ton	40.00	@
K-X.....	ton	150.00	@
K. M. R.....	ton	40.00	@
K. R. X.....	ton	40.00	@
Pioneer (c. l. factory).....	ton	60.00	@
(l. c. l. factory).....	ton	65.00	@
Raven M. R.....	ton	60.00	@65.00
Refined Elaterite.....	ton	175.00	@
Richmond.....	ton	75.00	@
No. 64.....	ton	44.00	@
318/320 M. P. hydrocarbon (c. l. factory).....	ton	50.00	@
(l. c. l. factory).....	ton	53.00	@
300/310 M. P. hydrocarbon (c. l. factory).....	ton	47.50	@
(l. c. l. factory).....	ton	50.00	@
Robertson, M. R. pulverized (c. l. factory).....	ton	95.00	@
M. R. pulverized (l. c. l. factory).....	ton	75.00	@
M. R. (c. l. factory).....	ton	72.50	@
M. R. (l. c. l. factory).....	ton	75.00	@
Rubrax (factory).....	ton	50.00	@
Synpro, granulated.....	ton	95.00	@
Walpole rubber flux (factory).....	lb.	.05	@

OILS.

Aviols compound	lb.	.17	@	.19
Castor, No. 1, U. S. P.	lb.	.18	@	
Castor, No. 3, U. S. P.	lb.	.17½	@	
Corn	lb.	.14	@	
Corn, refined Argo	cwt.	17.06	@	
Cotton	lb.	.13	@	
Glycerine (98 per cent.)	lb.	.20	@	.29
Linseed oil (No. 1 carloads)	gal.	1.40	@	1.45
Linseed compound	gal.	.85	@	
Palmoline	lb.	.14	@	.16
Palm niger	lb.	.13	@	
Palm special	lb.	.18	@	
Peanut	lb.	.15	@	
Petrolatum	lb.	.07	@	.12
Petrolatum, stick	lb.	.09	@	.12
Petroleum grease	lb.	.07½	@	.09
Pine, steam distilled	gal.	2.00	@	2.10
Rapeseed, refined	lb.	.20	@	
blown	lb.	.21	@	
Rosin	gal.	.70	@	.98
Synpro	lb.	.71	@	1.00
Soya bean	lb.	.14	@	
Tar	gal.	.42½	@	

RESINS AND PITCHES.

Balsam, fir	gal.	1.75	@	1.80
Castella gum	lb.	.55	@	
Camara resin, hard	lb.	.12	@	.16
soft	lb.	.10	@	.14
Tar, retort	bbl.	16.00	@	
kiln	bbl.	15.00	@	
Pitch, Burgundy	lb.	.08	@	.10
coal tar	lb.	.01 1/4	@	
pine tar	lb.	.04	@	
nonto	lb.	.04	@	
Rosin, K	bbl.	15.60	@	
stra ned	bbl.	14.50	@	
Shellac, fine orange	lb.	1.75	@	

SOLVENTS

Acetone (98.99 per cent drums).....	lb.	.25	@
methyl (drums).....	gal.	1.40	@
Benzol (water white, 90%).....	lb.	.33	@
Peta-naphthol.....	lb.	.85	@
Carbon bisulphide (drums).....	lb.	.08½	@ .09½
tetrachloride (drums).....	lb.	1.23½	@ .16
Naphtha, motor gasoline (steel bbls.).....	gal.	.32	@
73 @ 72 degrees (steel bbls.).....	gal.	.40	@
70 @ 72 degrees (steel bbls.).....	gal.	.40	@
68 @ 70 degrees (steel bbls.).....	gal.	.37	@
V. M. & P. (steel bbls.).....	gal.	.29	@

Toluol, pure	gal.	\$0.35	@ \$0.40%
Turpentine, spirits	gal.	1.59	@
wood	gal.	1.50	@ 1.55
Osmaco reducer	gal.	.65	@
Xylol, pure	gal.	.45	@ .50%
commercial	gal.	.35	@ .40

SUBSTITUTES.

Black	lb.	.10	@	.21
White	lb.	.11	@	.24
Brown	lb.	.15	@	.22
Brown factice	lb.	.09	@	.19
White factice	lb.	.10	@	.21
Paragol, soft and medium (carloads)	cwt.	18.58	@	
hard	cwt.	18.08	@	

VULCANIZING INGREDIENTS.

Lead, black hypsulphite (Black Hypo).....	lb.	.32	@	.39
Orange, in nerai, domestic.....	lb.	1.54	@	
Sulphur chloride (jugs).....	lb.	.20	@	
(drums).....	lb.	.08	@	
Sulphur, flour, Brooklyn brand (carloads).....	cwt.	3.40	@	
Bergenport, soft (c. l. factory).....	cwt.	3.65	@	
Bergenport, hard (c. l. factory).....	cwt.	4.00	@	
superfine (carloads, factory).....	cwt.	*2.00	@	2.25

(See also Colors—Antimony.)

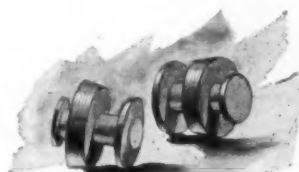
(See also Colors—Antimony.)

WAXES.

Wax, beeswax, white.....	lb.	.67	@
ceresin, white.....	lb.	.20	@
carnauba.....	lb.	.45	@
ozokerite, black.....	lb.	.65	@
green.....	lb.	.65	@
Montan.....	lb.	.26	@
paraffins, refined 118/120 m. p. (cases).....	lb.	.12	@
123/125 m. p. (cases).....	lb.	.12½	@
126/130 m. p. (cases).....	lb.	.14	@
Sweet wax.....	lb.	.14	@

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A little device that can be worn with comfort and without danger by those who delight in ocean sports, such as high diving, swimming, water polo, and the like, consists of two soft rubber disks mounted on a stem. These cling to the outer ear cavity, keeping the ear-drum protector in place, and permitting easy insertion and removal while, at the same time, preventing the protector from falling out. When in place the "Ocean" ear-drum protector is invisible. The protector comes in one size, which fits any ear, due to the elasticity of the rubber of which the disks are composed. The "Ocean" ear-drum protector is sold on display cards containing two dozen pairs neatly packed in small boxes attached to the card. (Safety Ear Drum Protector Co., 102 Lexington avenue, New York.)



"OCEAN" EAR DRUM PROTECTOR.

A HANDY REPAIR DEVICE.

The little invention pictured here in sectional view will, it is claimed, prevent throwing away a tire which has blown out. The "Dobbins" blow-out chains are attached when the tire is deflated, and the broken fabric and rubber are drawn together when inflated. The chains do not shift their position and are, it is said, as efficient for repairing a blow-out near the rim as in any other part of the tire. They are particularly designed for Fords and other lightweight cars and are made in two styles, for clincher and straight-side tires. With each chain is packed an inner patch which is to be placed directly over the hole or cut, on the inside of the shoe, with the sticky side next the casing. This device is easily attached, no tool other than an ordinary screwdriver being required. Full directions accompany the chains. (American Chain Co., Inc., Bridgeport, Connecticut.)



DOBBS BLOW-OUT CHAINS



Vol. 62 SEPTEMBER 1, 1920 No. 6

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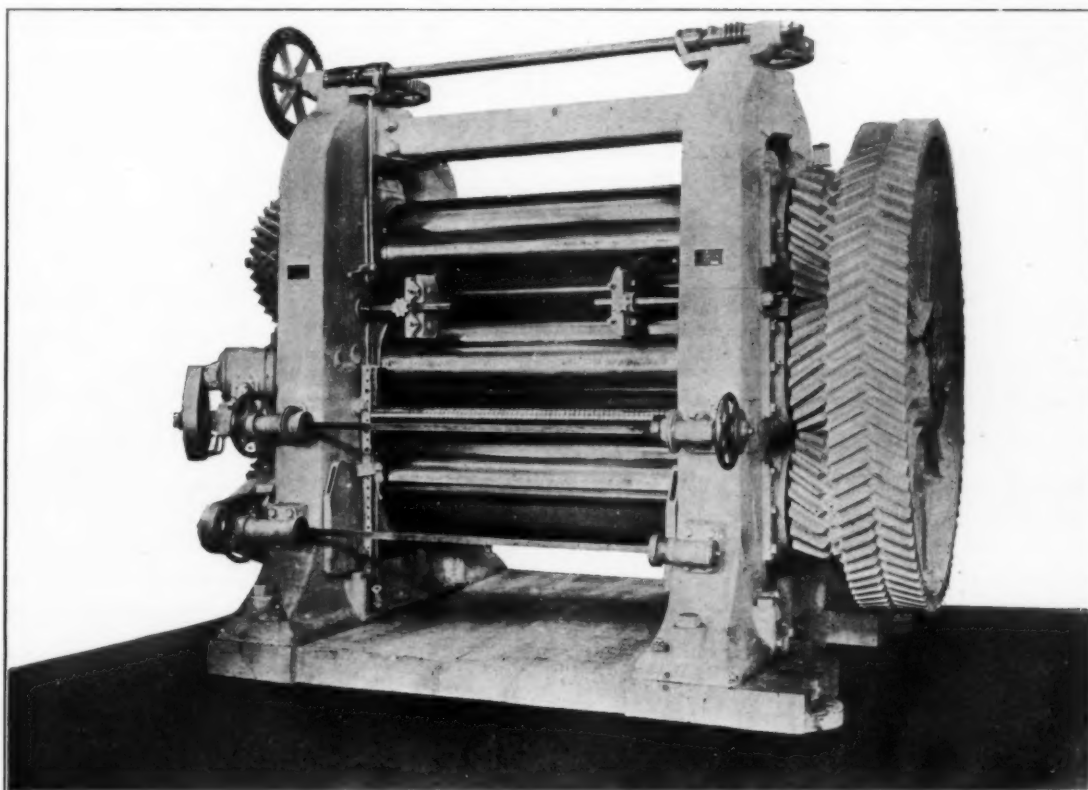
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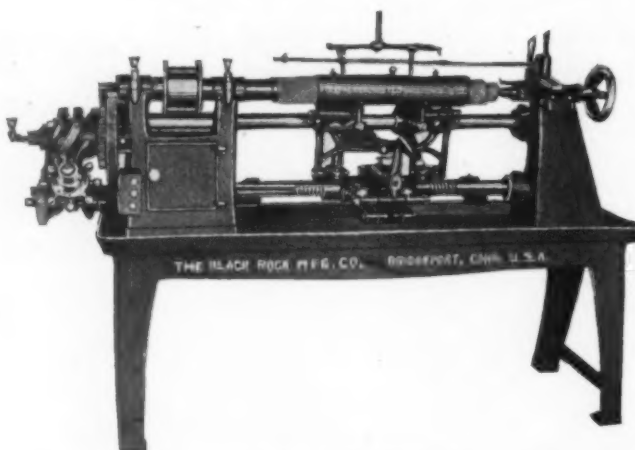
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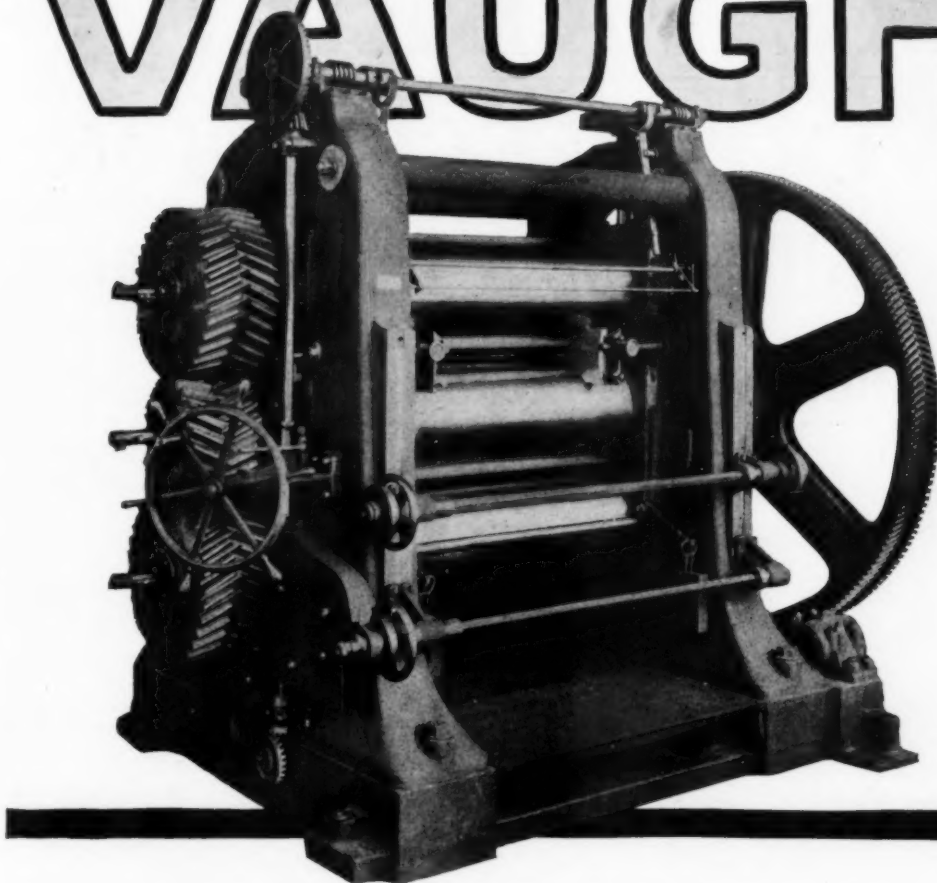
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PROVIDENCE, R. I.

Manufactures of

*India Rubber Thread
for Weaving and other uses*

*Card Cloths
of Woolen, Cotton and Rubber*

Rubber Coated Cloths

*Vulcanized or Unvulcanized for various purposes
CORRESPONDENCE SOLICITED*

ESTABLISHED 1853

EASTHAMPTON RUBBER THREAD CO.

EASTHAMPTON, MASS.

**Original Makers of RUBBER THREAD in America
Also Makers of RUBBER BANDS**

**Both THREAD and BANDS are made only of the best
UPRIVER FINE PARA RUBBER**

HARD RUBBER

**articles of every
description**

for Manufacturers of Soft Rubber Goods

AMERICAN HARD RUBBER CO.

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Branches:

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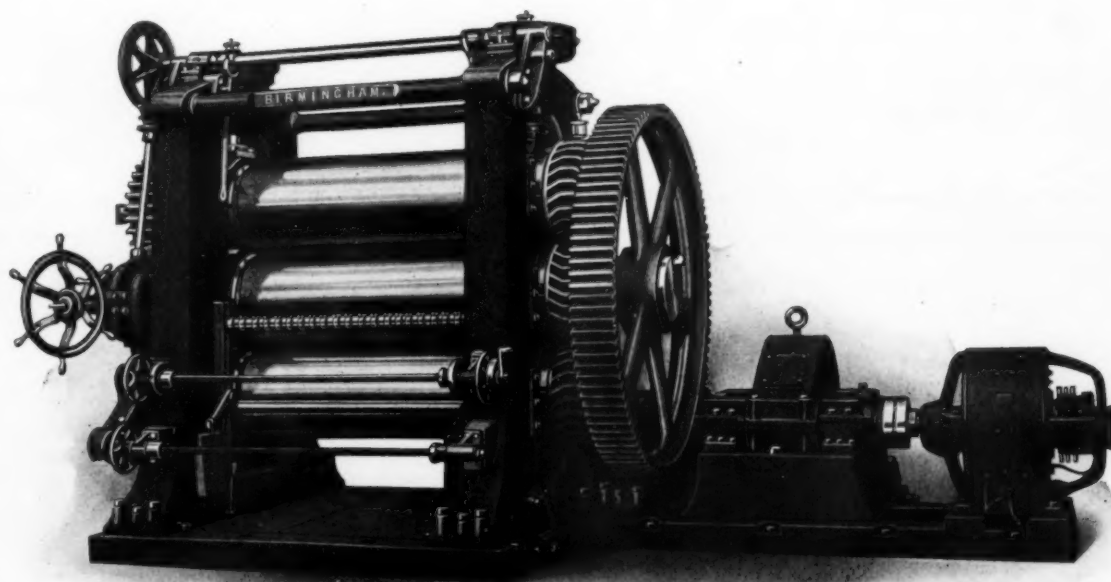
Established 1836

Incorporated 1850

"BIRMINGHAM"

**WASHERS, MILLS, CALENDERS, HYDRAULIC PRESSES,
DRIVES, SHAFTING, GEARING, CHILLED
AND SAND CAST ROLLS**

Banbury Automatic Rubber Mixing Machine }
Schofield Bias Shear } *(Patented)*
Birmingham Tread Making Machine }



24" x 66" Three-Roll Tire Calender with cut spur drive gear and pinion and drive.
(Herringbone Cut Gears and Gear Guards Optional)

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Established 1874

PROVIDENCE, R. I., U. S. A.

Manufacturers of

**Fine Rubber Goods for the Drug, Hos-
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Special Goods Made to Order

Both Molded and Hand Made

Sample Rooms

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FISK TIRES

THE completeness of the Fisk line constitutes a distinct advantage. Fisk distribution is unrivaled—there are 130 Fisk Branches.



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MANUFACTURED BY THE

**PLYMOUTH RUBBER CO.
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Hospital Sheetings, Artificial Leather, Coated Gem Canvas,
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The Largest Rubberizers of Cloth in the World

The Atlas Chemical Co.

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SINCE 1880

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Successor to

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RECLAIMED RUBBER

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WE CAN SATISFY YOU
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— ALSO —

GIVE US A TRIAL
WE CAN PROVE IT

JOS. STOKES RUBBER CO.
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PANTHER RUBBER MFG. CO.



Manufacturers of
Panther tread,
Indian, Surety and
Yankee, Rubber Heels.
Soles, Soling and
Patching.

We make a specialty of Rubber Heels and Rubber Soles, and use nothing but the best of material and workmanship.

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LONG-LIFE
Kokomo
TIRES AND TUBES
NONE BETTER
KOKOMO RUBBER CO.
KOKOMO, IND.



The Miner Rubber Company, Ltd.

FACTORY: GRANBY, QUE., CANADA

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Crude Rubber

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We will cheerfully furnish samples upon request

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Reclaimed Rubber

For All Purposes

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RUBBER REGENERATING COMPANY

Largest Reclaimers in the World

(FOUR FACTORIES)

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BLACK TIRE STOCKS

Surprising Net Value

Made by



Manufacturers of Puritan

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Shaft Couplings That Help Keep Up Uninterrupted Power Transmission

FRANCKE

FLEXIBLE COUPLINGS

For Direct-Connected Shafts

Power consumed in bearing friction is wearing-out power — worse than wasted — positively harmful. Misalignment magnifies it—multiplies your losses.

Francke All-Metal Flexible Couplings eliminate mis-alignment troubles and losses—permit each shaft of a direct-connected machine unit to run free in its own two bearings.

Results? Cool, smooth-running bearings—minimized friction and wear—minimized lubrication cost—freedom from repairs and interruptions to service — lower power consumption — all-around satisfaction.

And remember—the all-metal construction of the **Francke** gives it a life equal to that of the machine unit. Send for Bulletin 26.



PINTITE

RIGID COUPLINGS

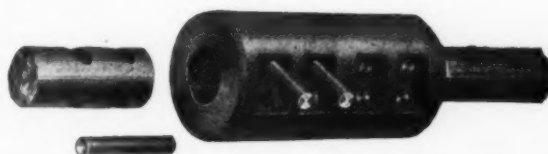
For Line Shafting

Slip the end of each shaft into the bore of the **Pintite** sleeve—place the pins in their holes and drive them flush, with a hammer—the job is done, and done right.

Each steel pin has a hardened cupped end that cuts a keyway across the shaft just deep enough. That gives the keyed grip.

And the driving in of the pins wedges the shaft against the recess opposite, in the bore of the coupling. That gives the wedge pressure.

There's double security in this double fastening of the **Pintite**. To take it off, drive out the pins. And think of the simplicity and time-saving of it. Bulletin 102?



Probably our experience would help you eliminate your shaft coupling troubles. We've installed shaft couplings aggregating over two and a quarter million horse-power.

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38 Central Ave., Newark, N. J.

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Electric Drive

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RUBBER MACHINERY

Use our experience on
your applications



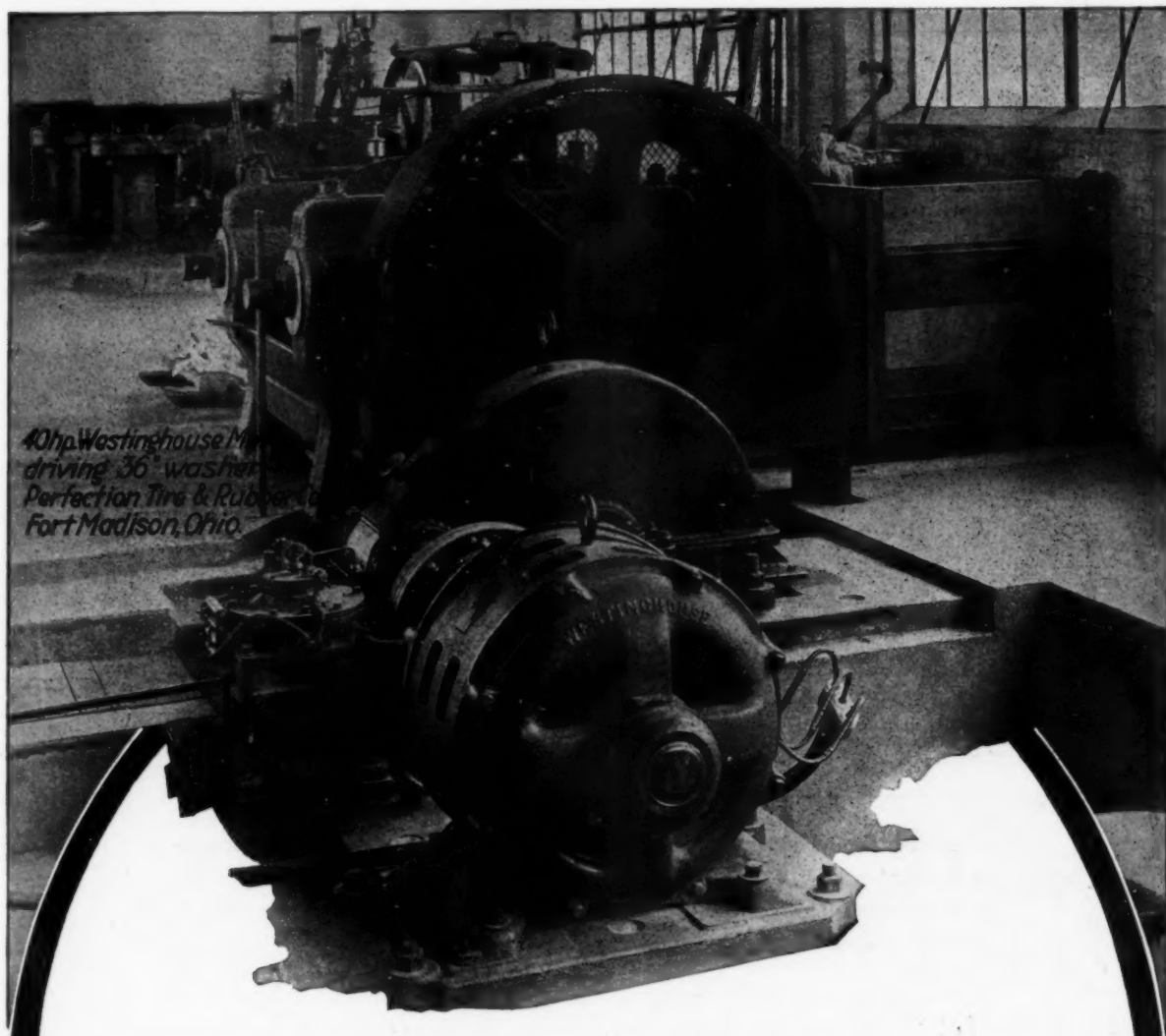
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A National Machinery House
with New and Guaranteed Used Apparatus

THE
ELECTRIC MOTOR AND
REPAIR COMPANY

AKRON OHIO



40hp. Westinghouse Motor
driving 36" washer
Perfection Tire & Rubber Co.
Fort Madison, Ohio.

Modern Methods

THE superior quality of rubber products manufactured today results from the use of the most modern and efficient types of machinery, which in recent years have made possible many refinements in the handling of rubber from the raw materials to the finished product.

Westinghouse Electrical Equipment For Rubber Factories

has kept abreast of every improvement in equipment and has on many occasions, because of its splendid performance, revealed the possibilities of still greater improvements of machinery it is called upon to operate. Among the users of Westinghouse Electrical Equipment will be found many of the most prominent rubber manufacturers.

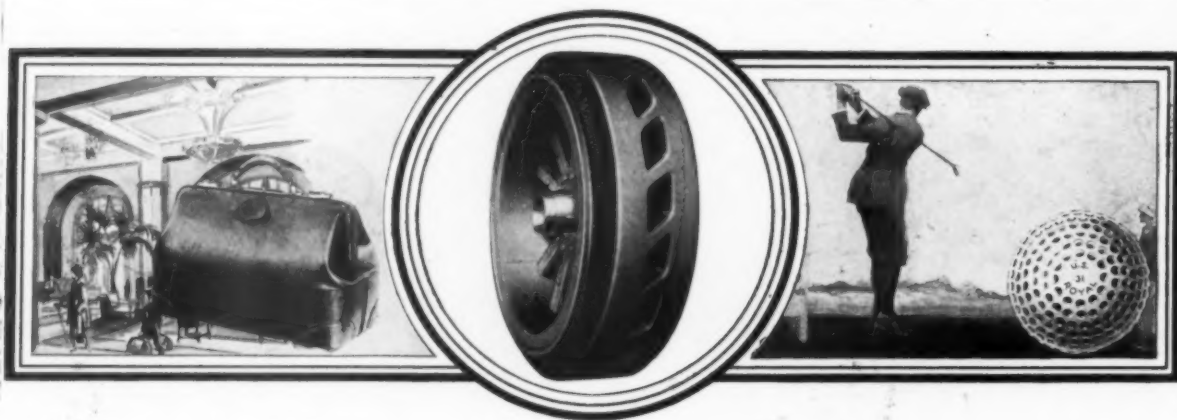
Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.

Sales Offices in All Large American Cities

1223

Westinghouse





The Newest Products of the

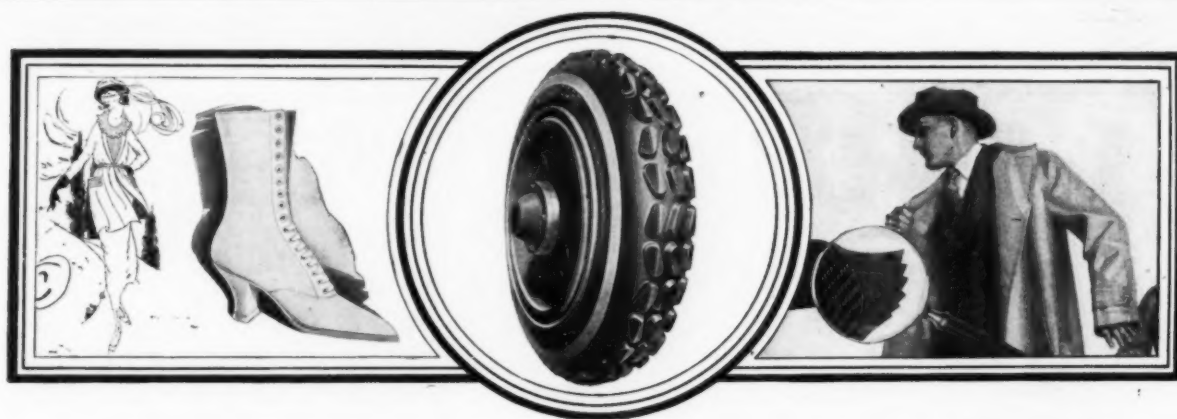
The oldest and largest rubber organization in the world maintains its leadership not only by controlling its supply of raw material and maintaining the highest standards of quality in its output but also because of its foresight in developing new products and markets.

Counting among its more than fifty factories those that were the first to vulcanize rubber, this Company's pride of leadership has been the impelling force behind the building up of facilities for research and development which today stand unequalled in the rubber industry.

The fruits of constant investigation and experiments have not been confined to any one group of United States Rubber Company products. While U. S. Tires are keeping pace with every new demand of the automobile world, U. S. mechanical rubber goods are meeting the ever-increasing demands of industry. Each season brings new styles in Keds and new models in Raynsters. Naugahyde Bags and the new U. S. Golf Balls are also included among the latest U. S. products.

United States Rubber Company





Oldest Rubber Organization

The new MONO-TWIN Truck Tire is the only solid truck tire of its kind in design and construction. It is built of grainless non-splitting rubber, and the possibility of base separation is done away with by effecting a chemical union between the steel and rubber—the first time this has been done. The combination of rubber cross-bars and depressions represents the greatest advance ever made in solid truck tire tractioning.

The pioneer pneumatic truck tire—the Nobby Cord—was brought out by the United States Rubber Company in 1911, after two years spent in developing it. There is incorporated in each Nobby Cord a structural strength beyond anything ever attempted in a pneumatic truck tire.

The first automobile cord tire ever made in America was built in 1903 by one of the factories of this Company, thus laying the foundation for saving millions of dollars annually to car owners.

The U. S. Seal on *any* rubber product stands for that quality and service that can be attained only by an organization possessing ample facilities and actuated by the true spirit of progress.

United States Rubber Company



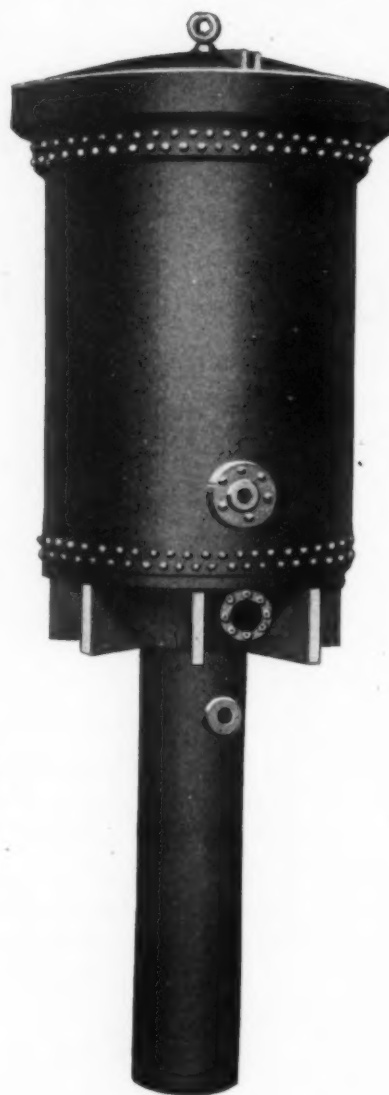
TIRE CURING PRESSES

Here is a sturdy, cast steel press with a boltless quick opening head.

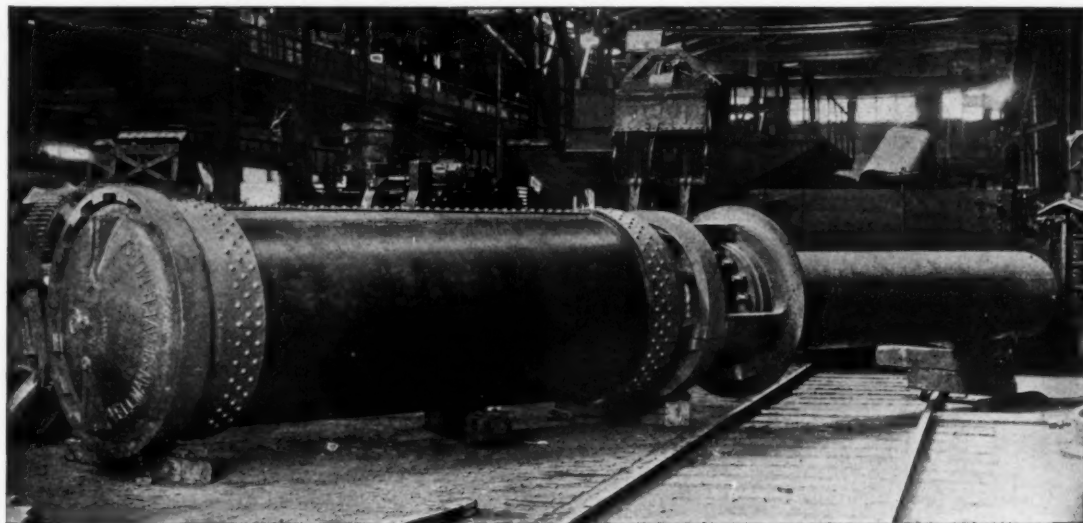
There is nothing new or untried about the design. It is simple and reliable without unnecessary frills.

Our prices and deliveries are reasonable.

And we make good molds and cores to be used in any press.



THE AKRON EQUIPMENT CO.
E. EXCHANGE ST. AT ANNADALE AVE.
AKRON, OHIO



The W-S-M Hydraulic Press Vulcanizers

The Wellman-Seaver-Morgan Company offers prompt delivery on Hydraulic Press Vulcanizers.

These Vulcanizers are built in all sizes—from the ones used in curing the smallest pneumatic casing to those used for the largest solid or cord pneumatic tires for motor trucks. Cylinders can be supplied for any hydraulic pressures and shells for any steam pressure within practical limits.

The Wellman-Seaver-Morgan Company is especially well equipped for manufacturing this class of machinery, as it has its own pattern shops, steel and iron foundries, boiler, structural and machine shops—each of which is equipped with modern machinery for efficiently handling its part of the work. There is a decided advantage in having all parts of a vulcanizer built by one manufacturer.

The Wellman-Seaver-Morgan Company manufactures a complete line of rubber machinery. Bulletins or engineering data concerning this equipment will be sent on request.

The Wellman-Seaver-Morgan Co.
CLEVELAND, OHIO

Manufactured and sold in Canada by
Canadian Ingersoll-Rand Co., Limited
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MINERAL RUBBER

A hard, natural hydrocarbon.

Produced under the strict supervision of an experienced and up-to-date laboratory.

Of uniform quality.

Aging tests unequalled.

Will not oxidize as do cheaper grades of mineral rubber.

Shipped to all parts of the world in metal drums.

The Barber Asphalt Paving Company

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*Producers of Gilsonite Trinidad and Bermudez Lake Asphalts,
and Asphaltic Products*



Economy Wire Wheel Brushes

MOUNT an Economy on an ordinary emery grinder, on a spindle or on a portable motor and you have an outfit ready at hand for all the usefulness illustrated here and a long list of other uses equally economical and convenient.

The wire in Economy Brushes is not of ordinary grade. Specially selected and heated, it resists long hard usage without losing its stiffness, without "matting" and without breaking off and leaving fine "needle points" in the rubber.

One trial proves all claims.

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Preparing inner tube for patch.



Buffing tire heads.

Buffing the ends of tubes preparatory to splicing.




Cleans rims, moulds, steel bases of solid tires or any other metal.

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Compressed Asbestos
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Guaranteed to meet any Flange Condition
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COMPETITION LIMITED: Build up a profitable trade on **your own** branded special quality and color compressed asbestos sheet packing, without fear of competition from your source of supply. No other American manufacturers market their sheet packing under these conditions.

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The World's Largest Compressed Asbestos Sheet Packing Manufacturer.

SAFETY

Demands the C-H Clutch-Brake

Quick stopping of the rolls does not mean a revolution or two. It means in a slight fraction of a revolution,—to save the loss of a hand, an arm,—a life.

You cannot afford to let an unsafe condition exist. Ask your Welfare Dept., your Plant Physician.

Although we make Magnetic Clutches as well as brakes, the *Clutch-Brake* combination only, meets the requirements of protection on your mill drives.



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Mechanical Rubber Goods

Daniel's P. P. P. Rod Packing
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Rubber
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Quaker
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QUAKER CITY RUBBER COMPANY

*Manufacturers of Mechanical Rubber Goods, Auto Tires
and Inner Tubes*

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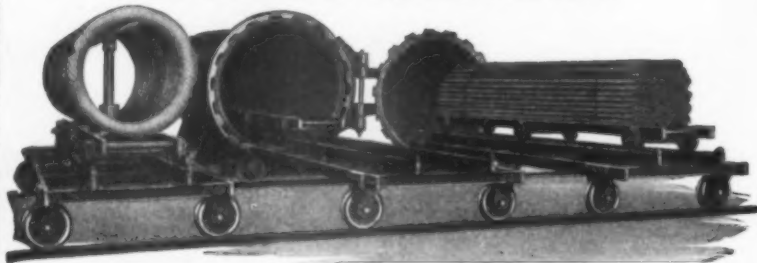
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SAFETY and EFFICIENCY combined by using the SIMPLEX BOLTLESS VULCANIZER DOOR on Horizontal and Vertical VULCANIZERS

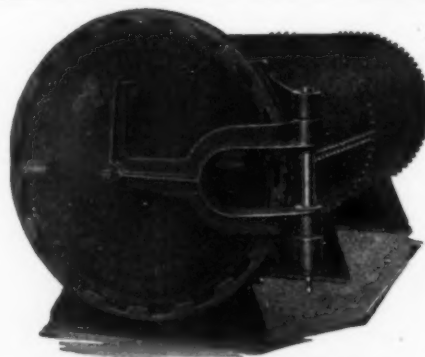


Equipment No. 800

illustrates our Standard Horizontal Vulcanizer, Simplex equipped, with inside track, car, two No. 600 outside transfer trucks, and special No. 44 inside cars. This makes an ideal equipment for handling inner tubes on straight poles as well as on circular mandrels, wrapped tread casings, etc.

WRITE FOR DESCRIPTIVE CATALOG NO. 17

THE BIGGS BOILER WORKS CO., Case Ave. & B. & O. R. R., AKRON, OHIO



Exclusive Features of the "Simplex" Door

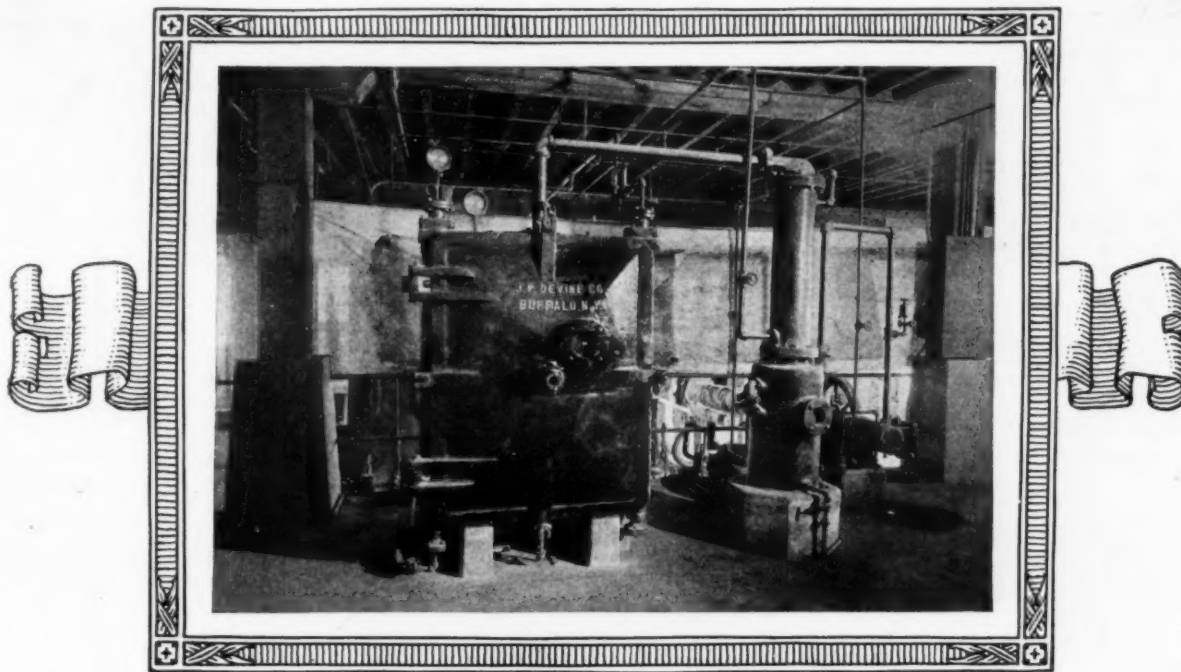
Safety and tightness of door is not subject to manual operation, as the entire load is automatically supported by heavy cast steel lugs. The locking mechanism is visible. A safety latch is provided so the door cannot be opened or closed with lugs out of relation. Accepted by The Hartford Steam Boiler Inspection & Insurance Company.

Absolutely self-contained, door operates on its own hinges. No counterweights or mechanical operating device required.

Free from annoying adjustments. Heavily designed, made of cast steel throughout. Will last indefinitely.

EFFICIENCY: Door can be opened and closed in less than thirty seconds. Fully guaranteed in every respect.

"Gasoline and Oil Storage Tanks"



Economy of Drying Time

When sheet rubber is dried in a Devine Vacuum Chamber Dryer, the time saved, from 12 to 24 hours, is a money-making advantage.

This has been often proven in the plant of the Washington Tire and Rubber Company, Spokane, Washington, whose installation is pictured above.

Together with the time-saving feature which includes labor saving, fuel saving, etc., there is the great advantage of getting better results from the rubber after treatment. It is a well-known fact that high temperature and oxidation cause loss of weight and loss of resiliency, which is avoided by the use of our Vacuum Dryers, as oxygen is absent during the process and the drying takes place at a low temperature due to the high vacuum maintained.

Write us for Bulletin 101-A on Vacuum Chamber Dryers.

We will have an exhibit at the Sixth National Exposition of Chemical Industries at the Grand Central Palace, New York City, the week of September 20th. We cordially invite you to come in and see us there.



*Linked for
Industrial
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J. P. DEVINE COMPANY

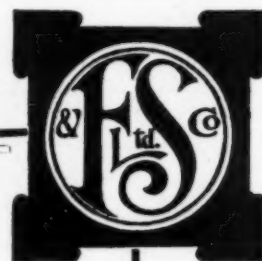
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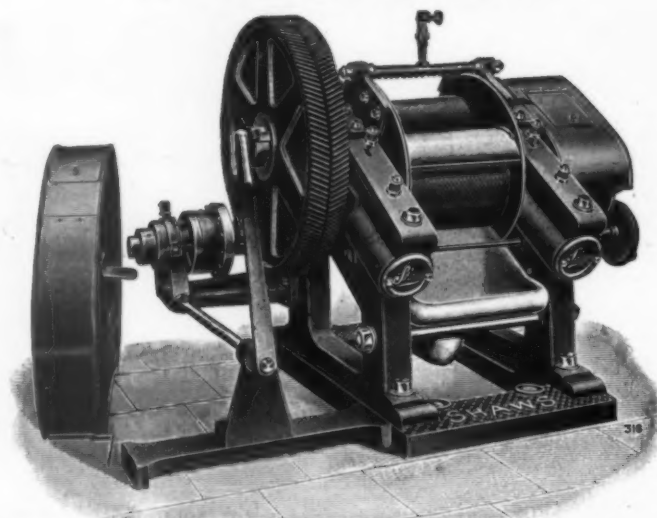


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Rubber Mill Machinery OF EVERY DESCRIPTION



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We were the pioneers of Rubber Plantation Machinery and since 1907 our machines have set the standard in the Far East, where there are more Shaw machines working than any other make.

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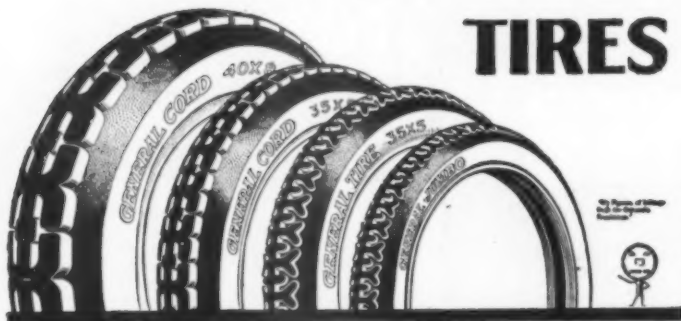
FRANCIS SHAW & CO., Ltd.

MANCHESTER, ENGLAND



Portage ALL OVERSIZE Tires	<i>Dealers Everywhere!</i>	Portage ALL OVERSIZE Tires
<i>Dealers Everywhere!</i>	Portage ALL OVERSIZE Tires	<i>Dealers Everywhere!</i>
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<i>Dealers Everywhere!</i>	Portage ALL OVERSIZE Tires	<i>Dealers Everywhere!</i>
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<p>PORTAGE TIRE & RUBBER CO. Akron</p>		

THE *GENERAL* TIRES



A
*Nation-Wide Reputation
for Quality*

The General Tire & Rubber Co.
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PURE ANILINE OIL, THIOCARBANILID

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ACETIC ACID ALL STRENGTHS, INCLUDING GLACIAL

Also SULPHURIC ACID, NITRIC ACID, AQUA FORTIS,
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THE NAUGATUCK CHEMICAL CO.

Established 1904

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THE MCGRAW TIRE & RUBBER CO.
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FACTORIES—EAST PALESTINE, OHIO

*Pneumatic Tires—Motor Truck Tires
Motorcycle Tires—Inner Tubes*

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The Best Engineers Specify "WESTERN"

WHEN THEY WANT THE BEST PUMP VALVES — BECAUSE
EVERY VALVE HAS OUR GUARANTEE BACK OF IT. LET US
CONSULT WITH YOU WHAT IS BEST FOR YOUR SERVICE.

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Exporters of Rubber

Continental Rubber Company of New York

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Usual Good Quality
20% Moisture Guarantee:
"Circle" and "Para" Brands

Washed and Dried,
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THE MANHATTAN RUBBER MFG. CO.

SOLE MAKERS
Condor
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NEW ORLEANS, 500 Camp St.
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SPOKANE, WASH., South 157 Monroe St.

CABLE ADDRESS—MIALOGIA, N. Y.

ADAMSON

Reduction Gear
Mill Line
Drive

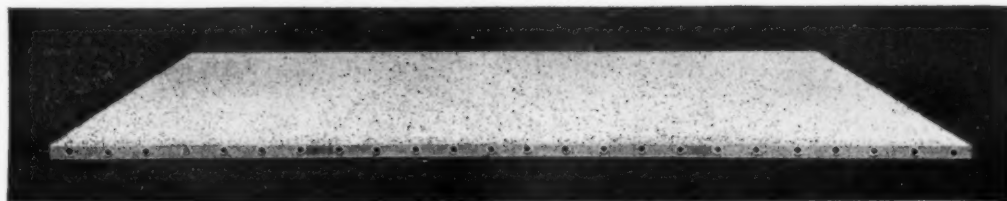
"We build heavy Rubber Machinery of all kinds and also build a complete line of Standard and Special Machines for all Rubber Working purposes. We have a large capacity for Automobile Tire Molds and Cores, and specialize particularly in these times in Steel and Semi-steel Molds for Solid Truck Tires. We operate our own Iron and Steel Foundries and can make prompt delivery."



**The Adamson
Machine
Company
Akron, Ohio**

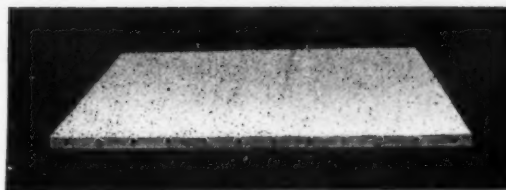
Replacing Cast Iron Platens

On New or Existing Presses



72" x 36"

Rolled Steel Steam Platens



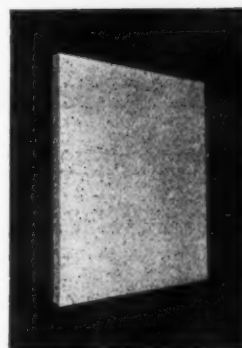
36" x 36"

These Rolled Steel Steam Platens, made exclusively by Southwark, are being generally adopted by users of steam pressure tables, on new presses and to replace cast iron platens on existing presses.

They are manufactured from the best grade rolled steel boiler plate, planed and polished on both surfaces, through drilled and cross-connected for efficient circulation of steam.

Among the advantages of the rolled steel platen over the cast iron are:

- 1st. Better finish because of hard, smooth surfaces.
- 2nd. Saving of time by reason of quicker heating and chilling.
- 3rd. Saving of steam on account of greatly reduced radiation surfaces of the platen edges.
- 4th. Greater comfort for the workers because of less wasted heat in the curing room.
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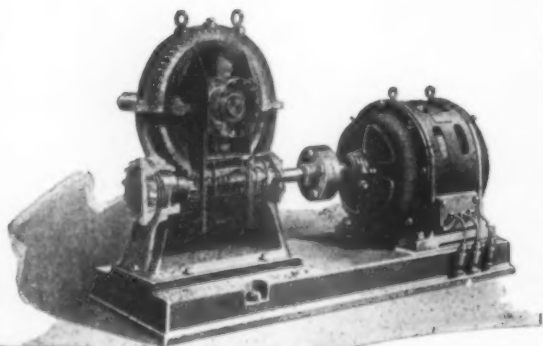


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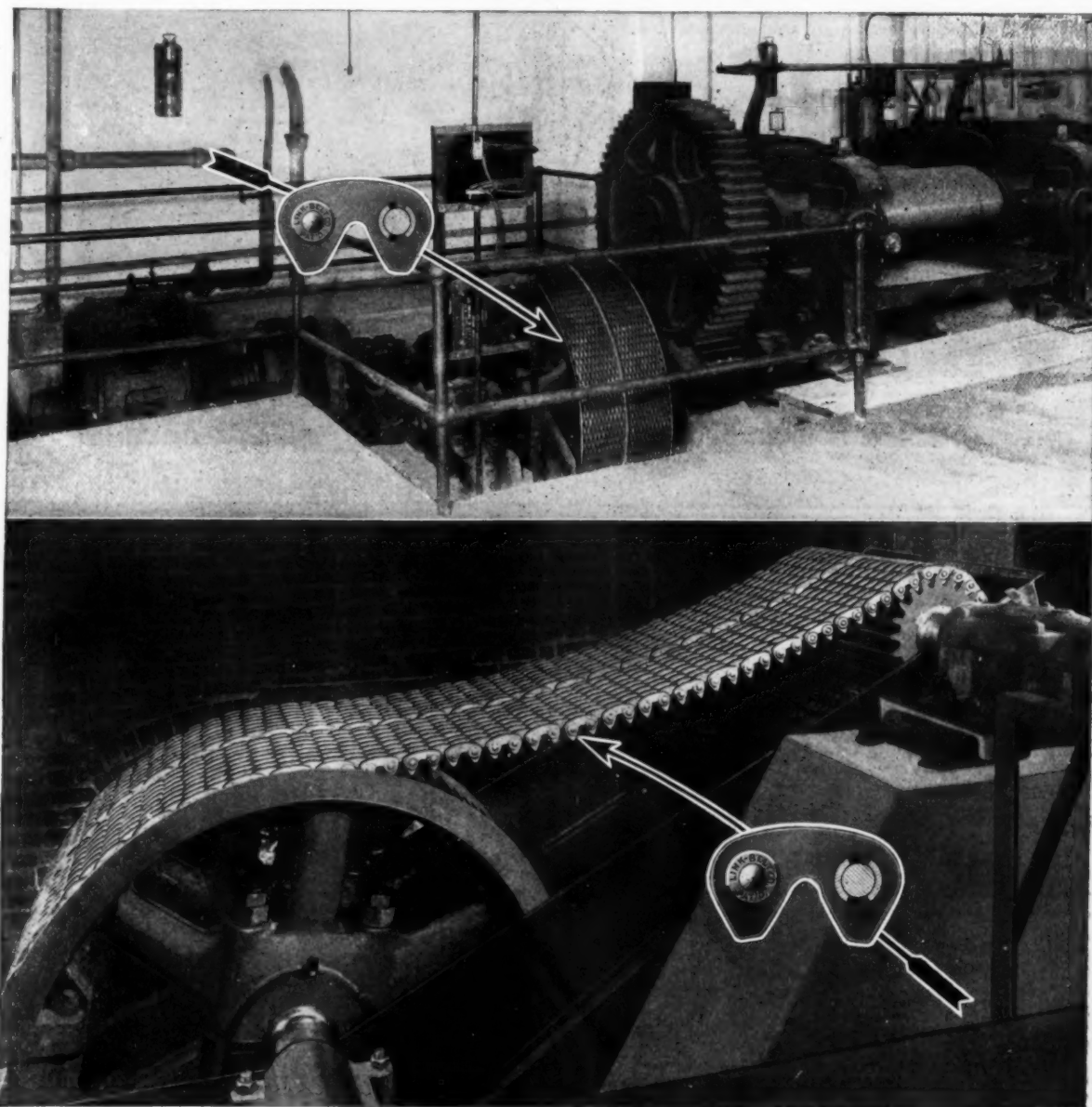
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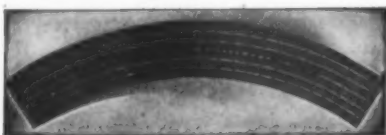


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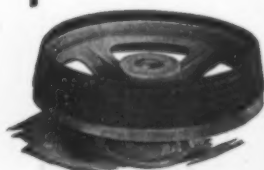
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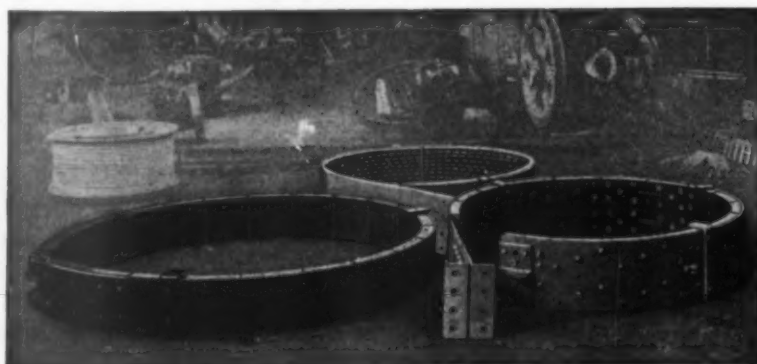
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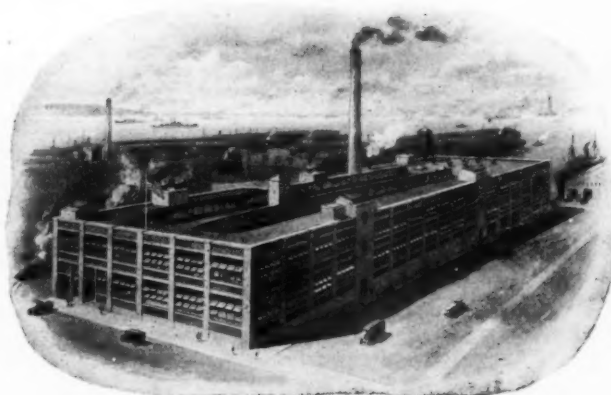
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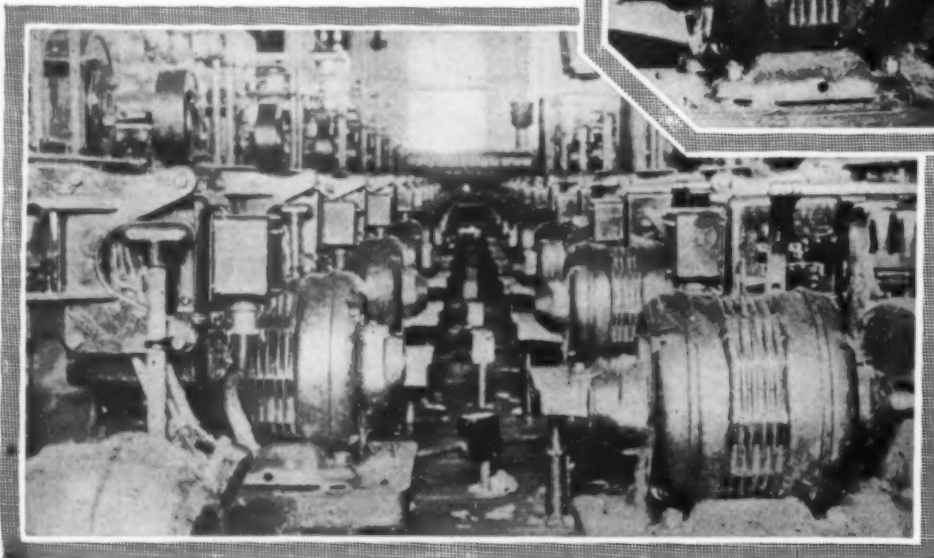
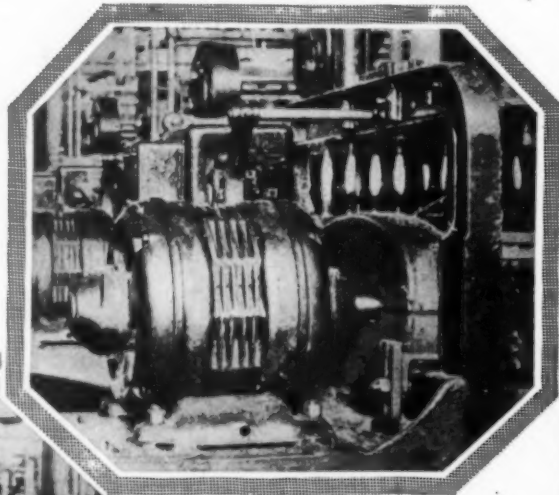
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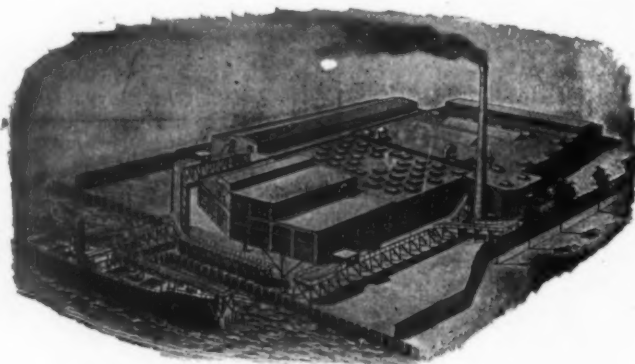
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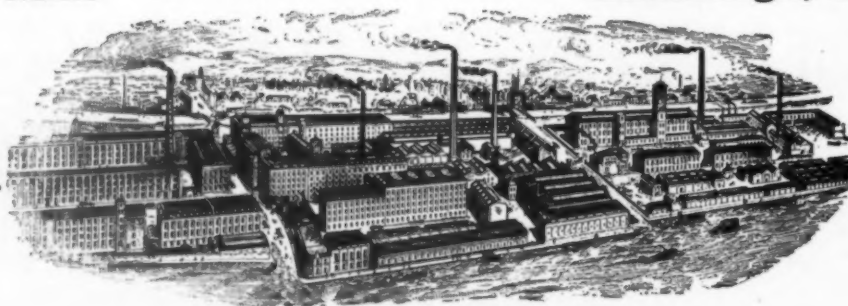
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No. 662, graphite)

"Garco" Products

cover a wide range, particularly in the direction of automotive and power engineering needs—both manufacturing and consuming. Most of the "Garco" Products are basically constructed from asbestos or from rubber and asbestos in combination. Woven and compressed sheet packings, rod packings, valve stem packings, hydraulic packings, asbestos textiles and brake linings broadly indicate the extent of the "Garco" lines in which manufacturers, jobbers and dealers will find especial interest. (See more complete list and several illustrated items above.)

Because "Garco" stands for the products of a huge plant having all the needed facilities for producing them through every process from raw materials to finished goods; because it has been a quarter-century policy that the products of the "Garco" plant shall be in the highest standards of quality possible; because the "Garco" assurance of satisfaction goes all the way to the consumer's hands—all offer good reasons why you should want to become better acquainted with "Garco" Products.

We want your inquiries.

GENERAL ASBESTOS AND RUBBER CO.

Main Office and Factories—Charleston, S. C.

Branches and Complete Stocks

58 Warren Street
New York

14 No. Franklin Street
Chicago

311 Water Street
Pittsburgh



Waterproofed, Rubberized and Combined

COATED FABRICS

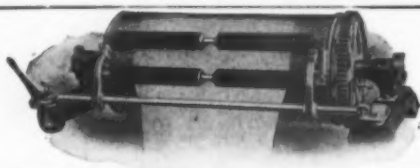


Single and Double Texture for Automobile Tops, Raincoats, Etc.

Centrally Located for Middle West Shipments

THE TOLEDO AUTO FABRICS CO.

Toledo, Ohio



Brush Cloth Stretcher operating on Calendar Roll Drum or Drying Cylinder.

SYDNEY BIRCH COMPANY, Inc.

Mansfield, Mass.

PATENT AUTOMATIC MACHINERY FOR

STRETCHING, GUIDING and WINDING TEXTILE FABRICS

Wet or Dry, Tacky and Coated Surface Materials.

NATIONAL ROSIN OIL & SIZE CO.

90 West St., New York

Largest Manufacturers of

1408 Ashland Block, Chicago, Ill.

ROSIN OIL

BURGUNDY PITCH

VENICE TURPENTINE

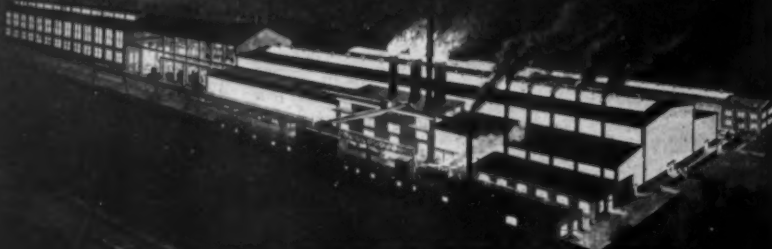
Especially prepared for Rubber Manufacturers and Reclaimers

Samples will be sent on request

Highest Attainment in VACUUM DRYER Construction

ACHIEVED AND PATENTED BY
**BUFFALO FOUNDRY
AND MACHINE
COMPANY**

BUFFALO, N. Y.
NEW YORK OFFICE
1432 WHITEHALL BUILDING
17 BATTERY PLACE.



"THE PLANT BEHIND THE APPARATUS"

European Rubber Manufacturers

Send Your Enquiries for

AMERICAN AND EUROPEAN

RUBBER SCRAP

Also Reclaimed Rubber to

J. SCHNURMANN

Downham Mills, Tottenham, London N 17

Telegrams—Reclaiming, London

American Rubber Manufacturers and Reclaimers

Send Your Enquiries for

AMERICAN AND EUROPEAN

RUBBER SCRAP

To

HERMANN WEBER

Representing

J. SCHNURMANN

Newark & Jackson Sts., Hoboken, N. J.

ALL GOODS SORTED TO CONSUMERS' REQUIREMENTS

Established 1873

Cable Address,
UNITMOSQUE.

P. O. Box 732.

WM. H. CUMMINGS & SONS

BUY AND SELL RUBBER SCRAP

60-62 Harrison Street, New York, U. S. A.

E. BERS & CO.,

ESTABLISHED 1890.

CABLE ADDRESS: BERSANDO, PHILA.

CODES: (A. B. C. 4th and 5th EDITION)
LIEBERS
PRIVATE

ALWAYS OPEN FOR ORDERS NO MATTER HOW LARGE OR SMALL

PHILADELPHIA and NEW YORK

Foreign and Domestic Correspondence Solicited

SCRAP RUBBER

CONDON COMPANY

T. L. CONDON - C. L. POST - A. M. WOLF

ENGINEERS

Designers of Industrial Buildings
Industrial - Architectural - Structural - Mechanical - Electrical
1435 MONADNOCK BLDG. CHICAGO, ILL.
PHONE HARRISON 69

TRADE MARK

VOORHEES RUBBER MFG CO MECHANICAL

RUBBER GOODS
AUTOMOBILE TUBES & ACCESSORIES
JERSEY CITY NEW JERSEY
NEW YORK OFFICE 30 READE ST.

Rubber Hose Exclusively

Capacity, 125,000 ft. per day

ORIGINATORS OF BRAIDED AND MOULDED HOSE.

BRAIDED HOSE AND TUBING IN SIZES FROM 3/16 IN. to 5 IN.
FOR ALL PURPOSES



"ELECTRIC" HOSE WEARS LIKE A PIG'S NOSE

RUBBER HOSE OF ALL KINDS

Moulded Hose Made for the Trade Under Their Brands When So Desired

ELECTRIC HOSE & RUBBER CO. — Specialists

WILMINGTON, DEL., U. S. A.

Branches: New York, Boston, Philadelphia, Cleveland, Chicago, New Orleans, London, Eng.



Telephones: Worth 1987*

Cable Address: DELAMADO

ALDENS' SUCCESSORS, INC.

290 Broadway, New York

CRUDE RUBBERALDENS' SUCCESSORS, LTD. London and Liverpool
ADELBERT H. ALDEN, LTD. Para and Manaus, BrazilALDENS' SUCCESSORS (Eastern), LTD., Penang
ALDENS' SUCCESSORS (Eastern), LTD., Singapore**CHAS. E. WOOD**

BROKER IN

**CRUDE RUBBER, BALATA, GUTTA
PERCHA AND KINDRED PRODUCTS**

Prompt Attention and Efficient Service to Buyer and Seller Alike

NEW YORKTel. Worth 5100, 5101, 5102, 5103,
5104, 5105, 5106, 5107.

287 Broadway, corner Reade St.

AKRON, OHIOBell Phone, Main, 7005, 7006, 7007
328 Central Savings & Trust Bldg.**CHICAGO, ILL.**Tel. Randolph 4436, 4437, 4438
Advertising Bldg., 123 W. Madison St.
Cable Address: "Chasewood"**THE ASKAM RUBBER CO.**

MILFORD, CONN.

RECLAIMED RUBBER**ASKAM SPECIAL WIRE STOCK****LOWEST SPECIFIC GRAVITY—HIGHEST TENSILE STRENGTH****SAMPLES FURNISHED ON REQUEST**TRENTON
N. J., U. S. A.**ESSEX RUBBER COMPANY**TRENTON
N. J., U. S. A.

INCORPORATED

**"ERCO" SOLES
"ESSEX" RUBBER HEELS
"TITE-EDGE" RUBBER HEELS
MOLDED SPECIALTIES****AUTOMOBILE
ACCESSORIES
INNER TUBES,
CEMENTS, ETC.****MOLDED RUBBER GOODS**

Our Publicity Page

ELIMINATING WASTE IN CIRCULATION.

THE BUGBEAR of the careful advertiser is waste in circulation. Every enterprising business concern values publicity, and usually devotes a fair percentage of its gross income to proclaiming in proper fashion the merits of its wares, but it rightly dreads waste in this direction just as it does in the various operations of manufacturing. Its attitude is economically correct.

Too Much Random Shooting

A concern supplying specialties for the perfumery trade would show poor judgment in appealing for business in a publication read mostly by cattle-raisers; and builders of heavy ore-crushers could hardly expect much from advertising placed in even the most widely sold ladies' magazine. Still it is surprising how many concerns that are otherwise well managed, are actually inefficient in placing their advertising. Swayed by impressive figures of circulation, makers of specialties for various trades often put expensive announcements in publications that have merely wide distribution, and yet of whose readers but a very small percentage are even remotely interested in the goods advertised.

When such advertisers find the returns disappointing they often conclude that fate is against them or that advertising is unsuited to their kind of business, and so they resolve to quit it entirely and to content themselves with the time-honored, but in these days too leisurely, method of getting orders only by personal solicitation. It had not occurred to them that they had simply blundered by buying waste circulation.

Value of Trade Papers

First-class trade publications, like THE INDIA RUBBER WORLD, not only spare advertisers loss due to waste circulation, but they offer them positive advantages in marketing their products. To them they present actual markets; they bring the goods, in striking text and pictures, before a veritable army of potential purchasers. In other words, in trade publications the wheat is carefully culled from the chaff, and the advertiser is not put to the expense and vexation of wasting his ammunition in gunning vaguely after uncertain prospects. It is for this reason that experienced advertisers regard THE INDIA RUBBER WORLD as absolutely indispensable in sales promotion.

Why Trade Papers Are Bought

It seems trite to say that trade publications are bought by readers to find out the newest developments and to keep

abreast of progress in a certain line of industry. But that is not all they expect to find in its columns. They are desirous of learning from the manufacturers' announcements what is new in rubber goods and what are the best and the newest devices for carrying out all the work and processes described in the news and special articles. We all read advertisements; we all have real or fancied needs, and we usually buy the advertised articles that appear to be indispensable to us. Success in advertising simply means making a convincing appeal, using the right mediums, and "delivering the goods."

Blue Book of the Rubber Trade

The Advertisers' Directory of THE INDIA RUBBER WORLD is justly styled the Blue Book of the Rubber Trade, and that title has been won by this journal being just as careful in selecting its advertising patrons as to character and dependability as they in turn are judicious in choosing their customers, extending them credit, and in ever striving to retain their confidence. Nor is this an idle boast on the part of this journal. It is a matter of history in the trade.

Indispensable to Purchasing Agents

Invaluable as is THE INDIA RUBBER WORLD to advertisers, it is equally indispensable to trained buyers. To purchasing agents in America and abroad THE INDIA RUBBER WORLD is the one great register for the rubber and allied trades. Even the best industrial directories may be a year old, but every month THE INDIA RUBBER WORLD appears with a comprehensive list of the leading manufacturers and dealers in all the varied lines in this great field which it covers, newly compiled and conveniently arranged.

Vast Collective Buying Power

Did you ever pause to estimate the collective buying power of the subscribers of THE INDIA RUBBER WORLD? It is incredible. No small number would express the total. Yet it is possible for every advertiser in the magazine, even the humblest, to obtain without delay or formality, a hearing with the largest purchasers.

Lastly

If you make or deal in something that the people in the rubber industry can really use to advantage, the sooner you tell them about it in the best medium the sooner will you win their gratitude and their patronage.

J. T. JOHNSTONE & CO., Inc.

IMPORTERS

CRUDE RUBBER

MERCHANTS

New York

Akron

Correspondents of L. SUTRO & CO., London, E. C.

THE STOCKTON RUBBER COMPANY,BELL TELEPHONE.
POSTAL TELEGRAPH.**STOCKTON, NEW JERSEY, U. S. A.****Manufacturers of all kinds of RECLAIMED RUBBER****D. J. PRICE, Superintendent and General Manager****NEW JERSEY RUBBER COMPANY****GOOD****L Series****VALUE****RECLAIMED RUBBER****Lambertville****OFFICE AND FACTORY****New Jersey****Moulded Rubber Specialties****Plumbers' Rubber Goods****CANFIELD RUBBER CO.****Railroad Avenue, BRIDGEPORT, CONN.**Manufactured to Buyers' Spec-
ification and Standard Grades.**Rings, Washers, Valves, Bumpers, Etc.**We solicit inquiries for
quotations and samples.**SCRAP RUBBER****If it pertains to**If it pertains to either the buying or
selling of **SCRAP RUBBER**, com-
municate with the office nearest
you. Four offices in four cities so as
to give that known "**BIRKENSTEIN**
SERVICE" to the trade.**CHICAGO** **NEW YORK**
PHILADELPHIA **MINNEAPOLIS****S. BIRKENSTEIN & SONS**
377 W. Ontario St. CHICAGO, ILLINOIS, U.S.A.**TUBES CURED ON
CIRCULAR MANDRELS****CIRCULAR PRESSED STEEL**

Tube Curing Mandrels

Neither wrinkle on in-
side nor thin on out-
side, which affords the
double advantage of**Requiring
Less Rubber
and
Eliminates
Danger
of Pinching****The Republic Tool & Manufacturing Company**
Cleveland, Ohio**FOR UNDERGROUND STEAM OR HOT WATER PIPES****THE
SIMPLE
RIC-WIL
METHOD**It is a clean-cut, complete and practical method of pipe
insulation. The kind that highly trained technical men and
practical operating engineers
both approve. Bulletin No. 1
explains RIC-WIL simplicity
and other features.
Write for it to-day.**The RIC-WIL
COMPANY
CLEVELAND****MID EAST TRADING COMPANY****Crude Rubber and
Produce Merchants**Cable Address:
"Mid-east" SingaporeCodes Used:
Weston's Under-
and Bentley's28 The Arcade
Raffles Place
Singapore, S. S.We are experts on these products, and guarantee to give
entire satisfaction on every shipment.**ADDITIONAL CONNECTIONS required in AMERICA,
UNITED KINGDOM and BELGIUM.**

A SUPERIOR LINE OF
Stockinettes and Jersey Cloths
Cotton, Wool and Worsted

adapted to the requirements of
 Rubber Goods Manufacturers

Linings for Footwear A Specialty

Made by the

United States Knitting Co.

PAWTUCKET

RHODE ISLAND

ESTABLISHED 1888

*We are Manufacturers of a
 COMPLETE LINE
 OF*

DRY PIGMENT COLORS

FOR
Rubber Manufacturers

Send us your inquiries

H. KOHNSTAMM & CO.

ESTABLISHED 1851.

83-93 Park Place

New York

The W.F. Gammeter Company

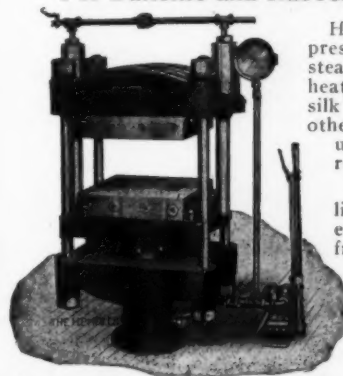
**Universal Calender Shells and
 Tire Machine Drums**

(PATENTED)

CADIZ, OHIO, U. S. A.

HYDRAULIC H-P-M PRESSES

For Bakelite and Rubber Vulcanizing



Hot and cold plate presses equipped for steam, gas or electrical heat; tire forcing presses, silk finishing presses and other forms of presses used in the rubber and related industries.

We make a complete line of Hydraulic Press equipment — pumps from the smallest to the largest; automatic poppet and operating valves; accumulators and fittings.

Special construction 42-ton 110t Plate Press

The Hydraulic Press Mfg. Co.

Engine-builders of hydraulic machinery exclusively

MOUNT GILEAD, OHIO

CLEVELAND BUFFALO DETROIT NEW YORK CITY
 SUFFERN, N. Y. KANSAS CITY

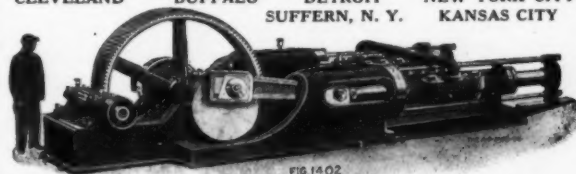
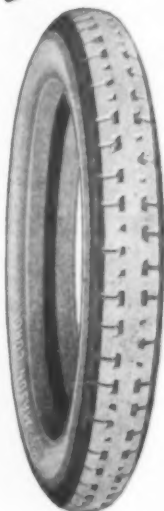


FIG. 14 02

MASON FABRIC, CORD AND SOLID TIRES AND INNER TUBES



Embody, in addition to highest quality materials, Individual Integrity of construction that yields the results calculated by their designers—men who have made a verity of the slogan—

MASON
MEANS
MORE MILEAGE

The Mason Tire & Rubber Co.
821 Lake St., Kent, Ohio
Akron District

MAGNESIA

REICHARD - COULSTON, Inc.
303 Fifth Avenue, New York, N. Y.

Columbia Whiting

Uniform, high-grade quality specially adapted for rubber manufacturers. Write for sample and prices.

The Columbia Products Co.
1012 Garfield Building Cleveland

Rubber Mill Machinery Dealer

Highest Cash Price Paid for
All Kinds of Rubber Machinery

New and Rebuilt Second-Hand
Rubber Machinery for Sale

PHILIP McGRORY
25-75 Pashley Avenue, Trenton, New Jersey

EMBOSSING CALENDERS

For Artificial Leather, Oil Cloth,
Carriage and Automobile Covers

DRYING MACHINES

with Copper or tinned iron Cylinders for Cotton Ducks
Drills and Sheetings

The Textile-Finishing Machinery Co.

Office, No. 83 Exchange Place
PROVIDENCE, R. I.

The Stuart Two-Pressure Operating Valve for Vulcanizers

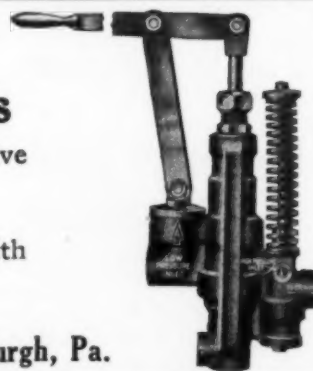
is a combined high pressure valve, low pressure valve, waste valve and check valve, all controlled by one three-position lever.

The high pressure water is automatically controlled.

They save high pressure water, increase output, are popular with operators and are fool proof.

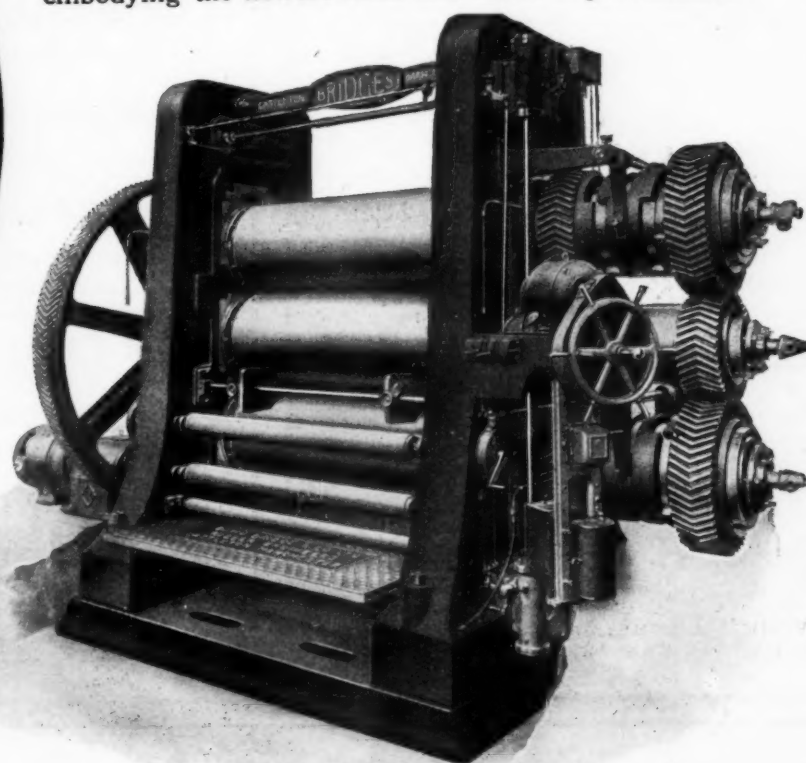
Write for Prices and Description.

PITTSBURGH VALVE, FOUNDRY & CONSTRUCTION CO., Pittsburgh, Pa.



B BRIDGE'S MODERN RUBBER MACHINERY.

Always abreast—or a little ahead—of current practice embodying the newest ideas and latest improvements.



Low Cost of Upkeep

"Advantage has been taken on reduced crop to overhaul factory, taking the machines by sections of four. Very little, considering the work they have continuously done, was found to be necessary."

Extract from letter from plantation using Bridge's Modern Machinery.

Large Motor-Driven Three-Bowl Universal Calendar BUILT FOR A WELL-KNOWN FIRM OF RUBBER MANUFACTURERS.

The machine complete weighs about 65 tons, the centre roller weighing $9\frac{1}{2}$ tons and the top and bottom rollers $8\frac{1}{2}$ tons. Owing to the high speed at which the calendar is to run—22.5 yards per minute—water-cooled bearings of special design have been adopted for the rollers. The latter are 30 inches diameter and 87 inches wide.

DAVID BRIDGE & Co. Ltd.
Castleton,  Manchester.
London Office — 35, Queen Victoria St. E.C.

Representative for America: W. D. CRUMPTON, Inc., 8-10 Bridge Street, New York City

MOLDS & CORES

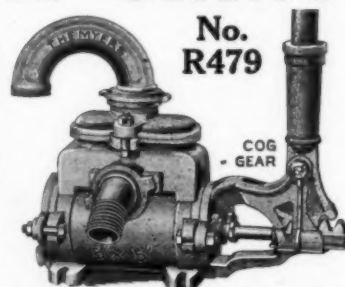
All non-skid designs and lettering engraved. Submit your non-skid design and copy of lettering. We do the rest.

CLAFLIN ENGINEERING CO.
LANCASTER, O.

MYERS GIANT

For Filling Tanks, Washing Out Boilers, Irrigation Purposes, Pumping Water from Trenches, Shallow Wells, Cellars, and Similar Duties.

The Myers Giant Low Down General Service Pump is designed for a wide range of pumping duties, and is an exceptionally desirable pump to have around for regular or emergency pumping work. It is one of the many styles of Myers "Honor-Built" Hand and Power Pumps for Every Service. Ask for Catalog showing the complete line.



No.
R479

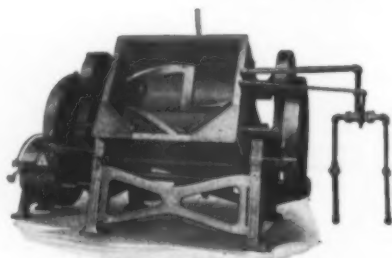
COG
- GEAR

F. E. MYERS & BRO.

Ashland, Ohio

Export Office: No. 11 Broadway, New York, N. Y.

Day Imperial Mixers for Rubber Compounds



Strong, heavy built machines, in four sizes, tank capacities of from 50 to 220 gallons. Also made with steam jackets for heating contents of tank while mixing.

Also other special mixers, screens, bolting, reels and sifters.

The J. H. Day Company
Cincinnati, Ohio

NEW YORK
CHICAGO

PHILADELPHIA
KANSAS CITY

BOSTON
BUFFALO

Established 1900

Incorporated 1919

The Kuhlke Machine Co.

Formerly Jones & Kuhlke

*Automobile Tire Molds
and Cores*

GENERAL MACHINE WORK

Cor. W. Exchange & Water Sts. **AKRON, OHIO**

NEW ENGLAND BUTT CO.

PROVIDENCE, R. I.

MANUFACTURERS OF

RUBBER
STRIP COVERING MACHINES
RUBBER
SPREADING MACHINES
RUBBER
HOSE BRAIDERS

The Franz Foundry & Machine Company

AKRON, OHIO

MOLDS—SPECIAL MACHINERY—CORES—TIRE REPAIR EQUIPMENT

UNUSUALLY WELL ADAPTED FOR TREAD ENGRAVING

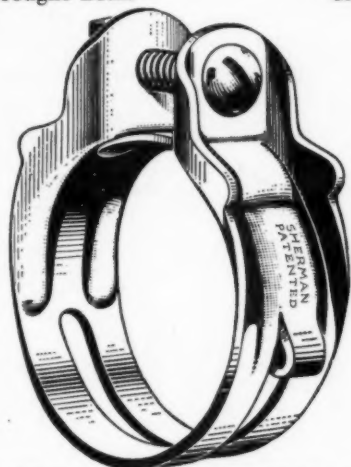
Factory - - - BARBERTON, OHIO

SHERMAN HOSE CLAMPS

The World's Standard

Heavy Wrought Brass

Cannot Rust

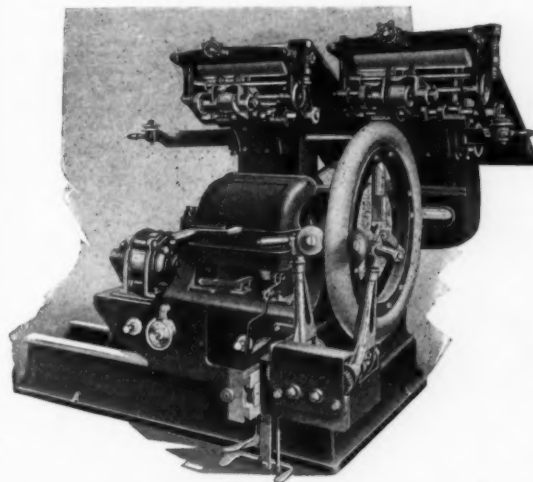


THE ONLY PERFECTLY SATISFACTORY
HOSE CLAMP MADE.

There Is a Sherman Clamp for Every Purpose
MADE ONLY BY

H. B. SHERMAN MFG. CO.
BATTLE CREEK, MICHIGAN

Pneumatic Tire Building Machine

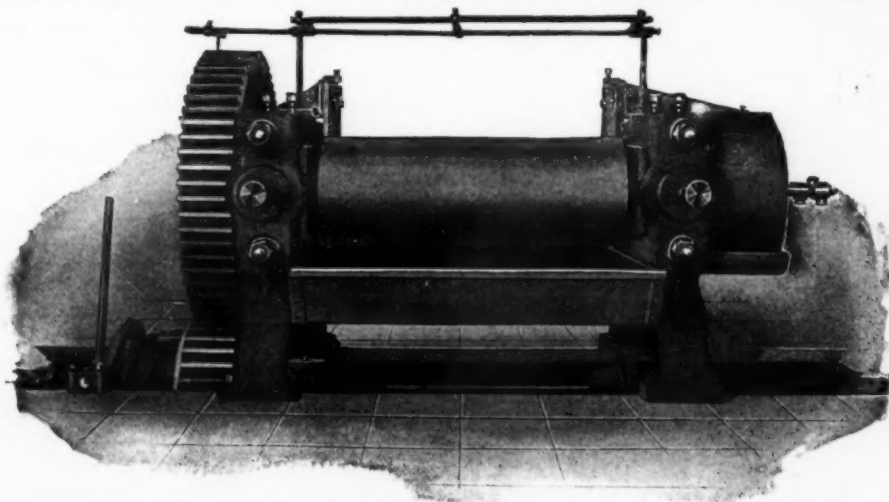


THE KNIGHT MANUFACTURING
COMPANY

1514 Market Avenue South

Canton, Ohio

MANUFACTURERS OF RUBBER MILL MACHINERY

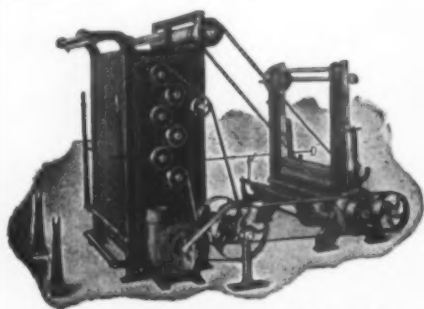


HIGH SPEED MIXING AND GRINDING MILL

18" x 50" with continuous bed, all iron adjustable guides, safety stop, steel mill pan; improved stuffing boxes, grease pan under small gears and guard over same; grease cups to lubricate roll journals; chilled iron rolls made of our special mixture of iron, giving them strength and a light wall so you can run the mill 10 to 15 per cent faster than the old type machines, without burning the stock.

WILLIAM R. THROPP & SONS CO.

TRENTON, N. J., U. S. A.



HEATH PATENT VERTICAL BRUSHES
With Calender Rolling Machine

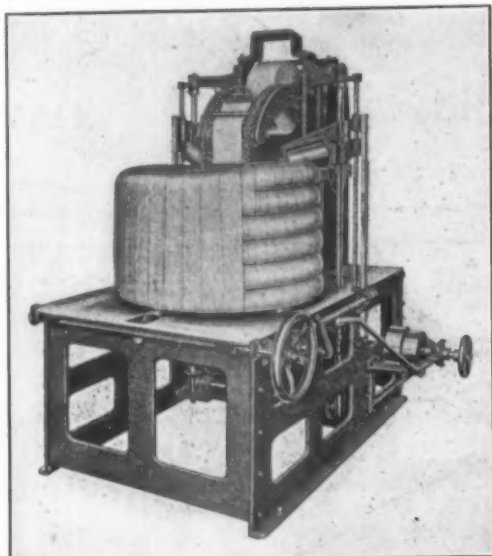
CURTIS & MARBLE MACHINE CO.

WORCESTER, MASSACHUSETTS

Brushing Machines, for cleaning goods to be coated; for brushing coated goods in connection with starch; or for cleaning cotton liners of soapstone, talc, etc.; Starching Attachments; Mill Sewing Machines, for stitching the ends of pieces together; Measuring Rolls and Dials; Rolling Machines; Inspecting Machines; Guide Frames; Machine Brushes of all kinds, etc.

The building of textile machinery for handling all varieties of cotton and other fabrics is our specialty.

One Bundle Every Minute



You can wrap one bundle of tires ready for shipment every minute by the use of the

T-W Tire Wrapping Machine

Will save you thousands of dollars on your shipping requirements.

Let us demonstrate—Let us prove it.

Write for descriptive circular today.

MANUFACTURERS

TERKELSEN & WENNBURG Boston, Mass.

MOLDS

SOLID

Tube Machines
Tire Repair Equipment

Write for new catalog



The Akron Rubber Mold & Machine Company

CORES

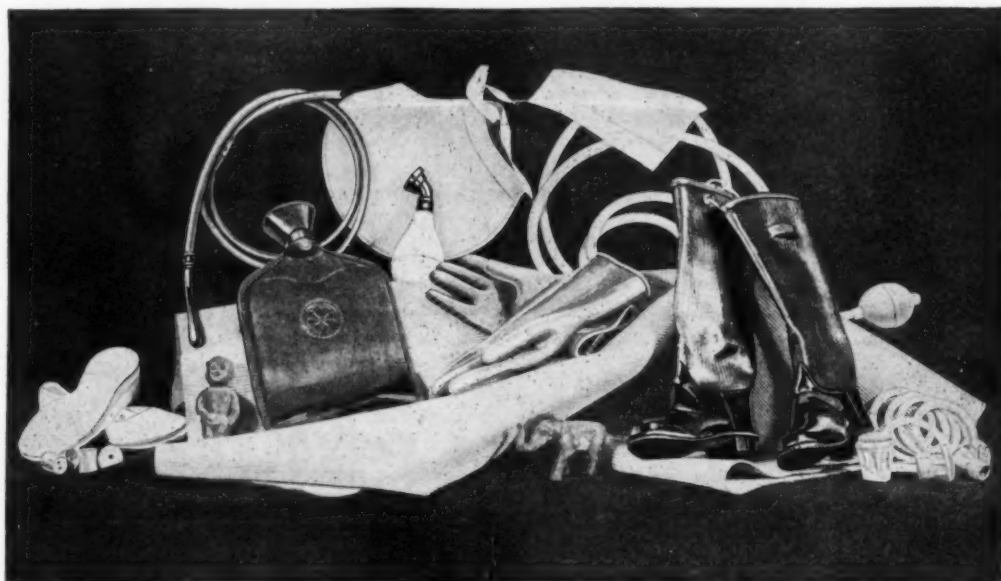
Sweitzer Ave., Akron, Ohio

CORES

PNEUMATIC

Tube Wrapping Lathes
Cord Tire Equipment

MOLDS



Wanted—Rubber Goods Factories

A RUBBER goods manufacturing plant cannot successfully make and market more of its product than it can bring in as raw materials and ship out as finished goods. Transportation is a vital factor in assembling the basic materials and distributing the completed merchandise. Crude rubber comes from the tropics. Cotton for the rubber industry comes from the South and Arizona. Many of the chemicals and compounding ingredients come from the East.

The transportation facilities to and from St. Louis make it the logical and most economical point for the location of a Mid-West factory, where it can assemble raw materials and supply the enormous demand for rubber goods in the Mississippi Valley, Southwest trade territory, Middle West, and Far West. The 26 railroads entering St. Louis furnish quick transportation to the markets in all directions.

The Mississippi River waterway transportation gives a direct route through the port of New Orleans for the tropical basic materials

needed in manufacture. Cotton is within easy reach of St. Louis without the costly freight charges to eastern points for the take-it-there-and-bring-it-back haul. There is a profitable market in St. Louis and its trade zones for automobile tires, mechanical rubber for medicinal and drug trade, rubber cloth, electrical equipment, belting and rubber sundries.

Rubber goods manufacture is one of the following sixteen industries St. Louis is seeking:

*Malleable iron castings
Screw machine products
Farm implements
Rubber products
Locomotive works*

*Cotton spinning and textile mills
Steel and copper wire
Machine tools and tool machinery
Automobile accessories and parts
Tanneries and leather goods
Shoe laces and findings*

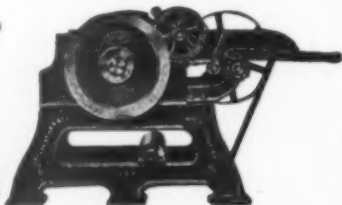
*Blast furnaces
Cork products
Small hardware
Dye stuffs
Drop forge plants*

The booklet "St. Louis as a Manufacturing Center" gives details that will interest you. A letter will bring it if addressed to

Director New Industries Bureau

St. Louis Chamber of Commerce

St. Louis, U. S. A.

Rubber**Scrap Cutters**

Will Properly Cut Up Your Rubber Scrap
Make the Work Easier for the Cracker.

TAYLOR, STILES & COMPANY, Riegelsville, N. J.

R. J. MARX, LONDON, E. C.,

Sole Agent for Europe



Showing Our
Model S. 4

**Tire
Building
Stands**

Write for Bulletin No. 181

MADE BY

PECHSTEIN IRON WORKS

KEOKUK

IOWA

THE WELLMAN COMPANY

are manufacturers of

**THE WELLMAN SOLE
CUTTING MACHINE**

for cutting soles, taps and other
irregular shapes at any bevel from
27° to 90° from sheet stock.
They are also in a position to
work out many of your engineer-
ing problems, to design and build
any tool or light machine needed
in your factory.

Send blue prints
of requirements to

WELLMAN COMPANY

Engineers and Machinists

MEDFORD, MASS.



Manufacturers of the

"HOUSATONIC"

Insulating, Tubing
and Rubber Strain-
ing Machines.

The Housatonic Machine
and Tool Co.

Bridgeport, Conn.

**Mason Reducing
Valves**

For the accurate control and reg-
ulation of steam pressures used
in connection with vulcanizers,
presses, etc.

SIMPLE :: COMPACT
RELIABLE
SEND FOR CATALOGUE

MASON REGULATOR CO.

1191 Adams St. Dorchester, Mass.

Manufacturers of

THROPP PNEUMATIC TIRE MAKING EQUIPMENT

TIRE MAKING MACHINES

WRAPPING MACHINES

HYDRAULIC PRESSES

HORIZONTAL TUBE VULCANIZERS

VERTICAL HYDRAULIC TIRE CURING VULCANIZERS

OPEN STEAM WRAPPED TREAD TIRE MOLDS

SEMI-STEEL FULL MOLDS

VERTICAL TIRE MOLDS

Estimates Given on Complete Equipment for Making Tires and Prices and Bulletins Furnished on Request.

JOHN E. THROPP'S SONS COMPANY

Trenton, N. J.

BECKTON WHITE

THE LITHOPONE FOR RUBBER MAKERS



This Dependable Zinc Sulphide Pigment

is fluffy and bulky. Produces a dense compound of low specific gravity.

*Warehouse Stocks
at convenient points*



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Successful Use



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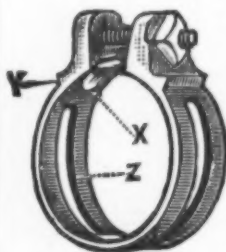
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Producers Highest Quality Bituminous Products

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In all the desirable elements of Hose Service when you buy "YERDON'S" CAST BRASS HOSE BANDS.

Made of a Special, RUST-PROOF, composition metal, exceptionally strong and durable, they hold the hose firmly with a double, all-around "Grip" assuring a permanently tight connection. They can be used repeatedly and will be right on the job doing Efficient work long after others are scrapped and forgotten.

ALL sizes for hose 3/4" O. D. up to the largest Suction Hose. Most satisfactory on automobile hose connections. Made in Fort Plain, U. S. A. Used everywhere. Unequalled by any.

We solicit your stock orders. If you don't know them write for samples. Both Home and Foreign trade supplied.

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The Non-Poisonous Accelerator

WHITING ZINC BARYTES
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Manufacturers of high-
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Tubes and Accessories.

Write for our distributors proposition.

TANKS TANKS TANKS

We manufacture galvanized dipping tanks, storage tanks, cement cans, etc., to your specifications and drawings. Write us for further information and prices.

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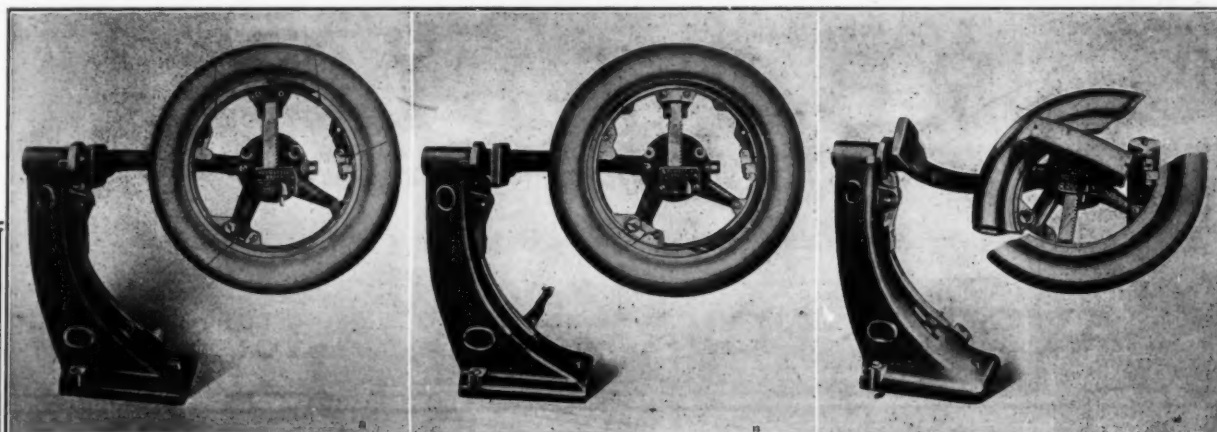
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FABRICS

OF ALL DESCRIPTIONS

For the Rubber Trade



L. u. n. i. d.

INTERESTING? IT SHOULD BE

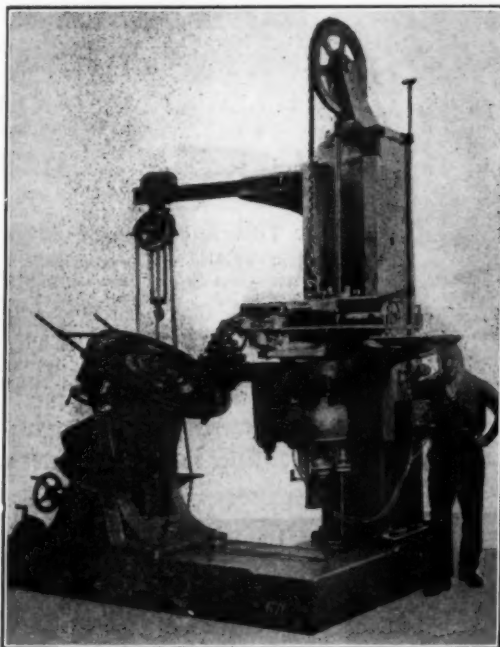
A completed **TIRE CASING** for bag cure can be **REMOVED FROM BUILDING CORE** and reset for building next tire all **IN** less than **ONE MINUTE**; operation performed **BY ONE TIRE MAKER** or finisher—**WITHOUT LIFTING CORE** from the building stand or machine.

Not an experiment, nearly one thousand in daily use by a number of leading tire manufacturers.

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Or Other Licensed Mould Manufacturers

WE SPECIALIZE IN BUILDING TIRE MOULD EQUIPMENT



The Gorton Tire Mold Engraving Machine

Heavy Non-Skid Tire Mold Engraving Machine

Adapted to cutting treads in molds or rings 44 inches in diameter and less. Machine equipped with indexing attachment. Master Mechanic of a large rubber company recently stated that the Gorton machine would beat any competing tool by 100 per cent. Leaders in the rubber industry doing the best and fastest work in tire mold engraving are using our machines.

They are to be found in such plants as

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MADE BY

GEORGE GORTON MACHINE CO.

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Also Makers of Machines for Engraving Letters, Figures, Designs on Bicycle and Motorcycle Molds

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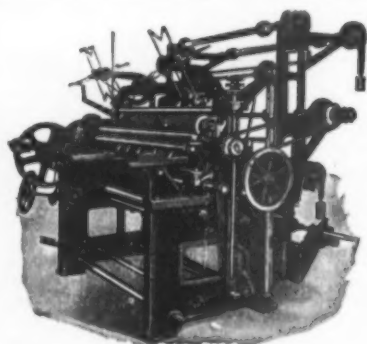
An inert pigment which smoothes and toughens tire compounds and materially lessens claims for adjustments.

Equally adapted to other compounds where durability and resiliency are required.

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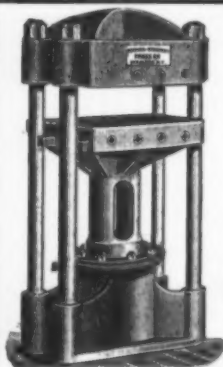


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Used by manufacturers of mechanical rubber goods including automobile tubes, insulating tape, rubber belting, and fabrics of all kinds.

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VULCANIZERS EXTRA PLY TIRES

Complete Outfits for Tire Shops and
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Twin Full Circle Tire Molds

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Superfine SULPHUR

Specially prepared to meet the requirements of rubber manufacturers, and now being used by many of the largest makers of rubber goods.

UNEXCELLED IN FINENESS

Guaranteed 95% to pass 200 mesh sieve.

Write for Samples and Prices to

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Brunswick TIRES

**Tubes, Mechanical and
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If it bears the name "BRUNSWICK"
you know it is right

The Brunswick-Balke-Collender Co.

GENERAL OFFICES:
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BRANCHES IN 41 LARGE CITIES

THE VULCANIZED RUBBER CO.

Manufacturers of

**Hard Rubber Goods
of every description**

**251 FOURTH AVENUE
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WORKS - MORRISVILLE, PA.

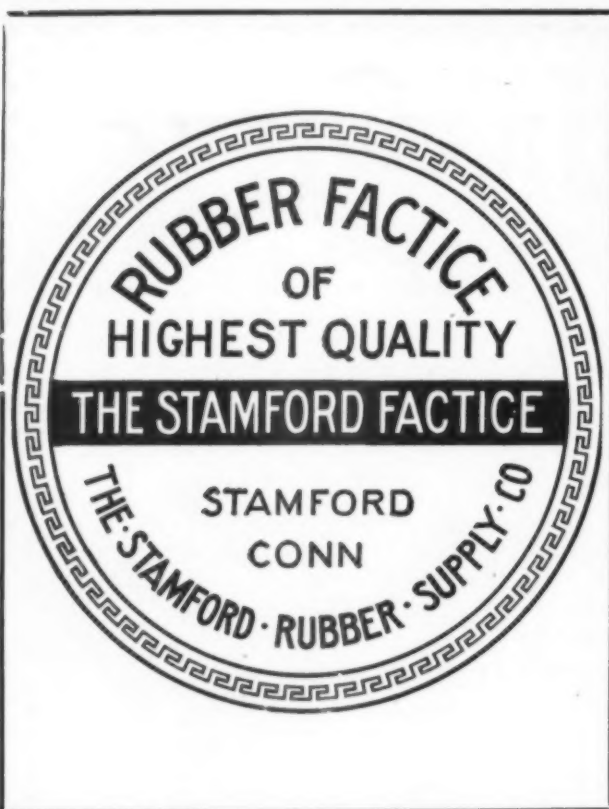


**The National Bureau
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Testing Dynamometer**

A high grade instrument
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Built and sold by

**THE HARTFORD SPECIAL
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TIRE FABRICS
Sea Island **OF** Egyptian
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THE CATALYTIC ACCELERATOR OF
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Time Saved 66 $\frac{2}{3}$ %

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THE MOST USEFUL DISCOVERY IN THE MANUFACTURE OF RUBBER GOODS.

Applications to J. C. MILNE & CO.

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New, Old, Cured and Uncured Scrap Rubber
ALL KINDS SECOND HAND RUBBER
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Distributors of Crude Rubber, High Grade Sheddies, Compounding Ingredients		

RAYMOND RUBBER CO.

RECLAIMED RUBBER

TITUSVILLE, NEW JERSEY

INC. FEB. 18, 1889

Small Advertisement Department

SITUATIONS WANTED

RECLAIMING. SUPERINTENDENT OF LARGE EASTERN FACTORY wants to make change. Could be ready from October first. Twenty-two years' experience, including several years' selling. Close buyer on scrap. If in need of such services, please advise. Willing to meet representative anywhere within 250 miles of New York. Address Box No. 4820, care of THE INDIA RUBBER WORLD.

CHEMIST, M.A. LEADING UNIVERSITY, AGE 31, WIDE EXPERIENCE in industrial research and general technical work, at present chief chemist for small rubber tire company, wishes to join research or development department of established company. Address Box No. 4826, care of THE INDIA RUBBER WORLD.

EXPORT MANAGER, EXECUTIVE ORGANIZER OF unquestionable ability commanding connections established by personal contact, with full knowledge of sales management, domestic as well as foreign, is open for engagement with respectable rubber company making tires and tubes. One with mechanical line added preferable for quantity sales. Experience of 18 years. Salary in proportion to volume of sales. Part commission preferable. Personal interview solicited. Address Box No. 4825, care of The India Rubber World.

SALESMAN AND DEMONSTRATOR WIDELY KNOWN IN RUBBER mills desires line of reclaimed or compounding ingredients and accelerators. Address Box No. 4803, care of THE INDIA RUBBER WORLD.

CRUDE RUBBER MAN, AT PRESENT IN BROKERAGE HOUSE, desires a change. Address Box No. 4804, care of THE INDIA RUBBER WORLD.

SUPERINTENDENT OF PLANT PRODUCING TIRES AND TUBES preferably in the East, by one with long and valuable experience, capable of efficient organizing and familiar with all processes of manufacturing. At present engaged but seeking better position. Address Box No. 4802, care of THE INDIA RUBBER WORLD.

SALESMAN. I HAVE BEEN IN THE RUBBER BUSINESS MORE than 20 years. My specialty is reclaimed. I want to handle several lines selling to manufacturers, including reclaimed rubber, crude rubber, oils and compounding ingredients, etc. Would consider proposition to handle a good line of shoddy exclusively. If interested address Box No. 4824, care of THE INDIA RUBBER WORLD.

RUBBER CHEMIST WANTS OPENING AS SALESMAN FOR TIRES or rubber chemicals. Has had large experience in mechanicals and tires. Address Box No. 4737, care of THE INDIA RUBBER WORLD.

FACTORY MANAGER: TECHNICAL GRADUATE, AGE 33, with several years' experience in the manufacture of high-grade auto tires and tubes, desires new connection with a well-financed firm in a similar capacity. Address Box No. 4601, care of The India Rubber World.

RUBBER CHEMIST EXPERT IN TIRES, TUBES AND MECHANICALS is open for position as chief chemist or assistant superintendent in rubber manufacturing any of these lines. Address Box No. 4736, care of THE INDIA RUBBER WORLD.

FACTORY PRODUCTION MANAGER WILL BE OPEN FOR POSITION with a live company where push and experience will be recognized. Have had thirty-seven years of practical rubber manufacturing experience in various lines, specializing in tires, tubes and accessories, all kinds of raw stock for various trades, molded goods of every description, acquainted with all details of rubber factories in general. Those looking for first-class man and hustler will please write at once. Address Box No. 4733, care of THE INDIA RUBBER WORLD.

RUBBER TIRE MAN, COLLEGE GRADUATE, CHEMICAL ENGINEERING course, two years' experience in general analytical laboratory, two years' experience in rubber tire factory as tire construction designer and technical adviser to superintendent, wishes position as assistant superintendent with firm manufacturing auto tires. Address Box No. 4633, care of THE INDIA RUBBER WORLD.

RUBBER CHEMIST AND COMPOUNDER, SINGLE, AGE 26. FOUR years' experience in compounding and factory control work in rubber belting, packing, and molded goods. At liberty any time and willing to go anywhere. Address Box No. 4719, care of THE INDIA RUBBER WORLD.

WANTED: POSITION AS SALESMAN OR SALESMAN, EXPERIENCED in charge of selling force, road and city trade in rubber fabrics, including piano action trade, automobile fabrics, rubber sheeting, raincoat and proofing of all fabrics. Knowledge of cloth and factory production work. Address Box No. 4829, care of THE INDIA RUBBER WORLD.

SITUATIONS WANTED—Continued

MECHANICAL ENGINEER, COLLEGE GRADUATE, 31 YEARS OLD, with rubber experience in machine design, general engineering work, tire building and repair, desires position with a tire concern to assist in tire design, experimental and developing work. Address Box No. 4827, care of THE INDIA RUBBER WORLD.

INNER TUBE FOREMAN, NOW EMPLOYED, DESIRES CHANGE. Long experience. Can remedy any trouble. Address Box No. 4828, care of THE INDIA RUBBER WORLD.

WANTED: POSITION AS MILL ROOM FOREMAN BY MAN WITH 33 years' rubber manufacturing experience, 28 years in insulated wire as foreman and superintendent. Expert compounder and millman. Unqualified references. Address Box No. 4819, care of THE INDIA RUBBER WORLD.

WANTED: SHOE FACTORY POSITION. CAN MAKE PATTERNS and manage cutting and making rooms. Address Box No. 4822, care of THE INDIA RUBBER WORLD.

WANTED: POSITION ON FOOTWEAR. ABLE TO TAKE CHARGE of any factory department or buying. Used to making tests on all raw materials. Address Box No. 4823, care of THE INDIA RUBBER WORLD.

ADVERTISING MANAGER, SPECIALLY TRAINED IN ADVERTISING, dealer help and sales promotion work for general lines of mechanical rubber goods—soles, heels, tubing, matting, belting, hose and packing. National campaigns, house organs, etc. Address Box No. 4837, care of THE INDIA RUBBER WORLD.

WANTED: POSITION AS ASSISTANT SUPERINTENDENT or chief chemist in the rubber line; 10 years as head chemist in rubber boots and shoes, clothing, and reclaiming. Fully capable; will furnish references during correspondence. Address Box No. 4840, care of The India Rubber World.

SITUATION WANTED BY A MASTER MECHANIC WITH 18 YEARS' practical experience. Can build rubber plants from the ground up, and am able to set up and maintain any type of rubber machinery in use today. Thoroughly understand electricity, steam, hydraulic and air, also textile machinery and the manufacture of fabrics. Can handle any size plant and any number of men. Address Box No. 4793, care of THE INDIA RUBBER WORLD.

SALES MANAGER, NOW EMPLOYED, IS OPEN FOR NEGOTIATIONS with tire manufacturer who desires successful and high-class sales executive. Age 33, wide spread and personal acquaintance throughout the United States and Canada, also the principal export trade. Can command enviable volume through jobbing channels and larger dealers. Invite correspondence with substantial manufacturers, who are desirous of expansion and whose facilities include daily production of at least 500 tires. Address Box No. 4842, care of THE INDIA RUBBER WORLD.

SITUATIONS OPEN

WANTED: CHEMIST. ONE EXPERIENCED IN RUBBER AND general analyses. Principal work is in rubber. Apply with references. Address Box No. 4834, care of THE INDIA RUBBER WORLD.

WANTED: FACTORY MANAGER, TO TAKE CHARGE OF TIRE and tube production in factory located near New York. Man having technical and practical experience in production methods of cord and fabric tires and who can produce results. Write, stating references, where employed, length of service, salary requested, and approximate date when you can start work. Address Box No. 4830, care of THE INDIA RUBBER WORLD.

WANTED: EXPERIENCED SALESMAN FOR THE RUBBER-SURFACED clothing trade. Please give in reply full particulars as to experience and territory covered; also state whether salary or commission is desired. All communications will be treated as confidential. Address Box No. 4831, care of THE INDIA RUBBER WORLD.

WANTED: A CALENDER MAN WITH SEVERAL YEARS' PRACTICAL experience on calender work on tire fabrics and stocks for a large new tire factory in Buffalo, New York. Address, stating age, experience, and salary expected, Box No. 4797, care of THE INDIA RUBBER WORLD.

WANTED: GENERAL SUPERINTENDENT IN SMALL BUT RAPIDLY growing rubber factory, located in large middle western city. Knowledge of chemistry, manufacturing of tire gums and friction tape essential. This is an unusual opportunity for young man of integrity and ability to develop into big executive position. Such a man may now be located where field is limited or surroundings uncongenial. All replies will be considered confidential and should give age, education, experience, names of past and present employers and approximate salary desired. Address Box No. 4799, care of THE INDIA RUBBER WORLD.

(Advertisements continued on page 82.)

WATER

WE-FU-GO AND SCAIFE
PURIFICATION SYSTEMS
SOFTENING & FILTRATION
FOR BOILER FEED AND
ALL INDUSTRIAL USES

WM B. SCAIFE & SONS CO. PITTSBURGH, PA.

Small Advertisement Department—Continued.

SITUATIONS OPEN—Continued

WANTED: A SPREADING MAN WITH SEVERAL YEARS' PRACTICAL experience to run a spreader in the experimental department of a large new rubber tire factory in Buffalo, New York. Address, stating age, experience, and salary expected, Box No. 4795, care of THE INDIA RUBBER WORLD.

WANTED: CHEMIST OR ENGINEER OR TECHNICAL MAN WHO is thoroughly familiar with the manufacture of rubber covered rolls, particularly large rolls for printing and lithographing presses. All replies confidential. Address Box No. 4818, care of THE INDIA RUBBER WORLD.

WANTED: A TUBING MACHINE OPERATOR THOROUGHLY EXPERIENCED on tubing machine work for a large new tire factory in Buffalo, New York. Must have experience on tire stocks. Address, stating age, experience, and salary expected, Box No. 4796, care of THE INDIA RUBBER WORLD.

BUSINESS OPPORTUNITIES

FOR SALE OR RENT: FULLY EQUIPPED RUBBER FOOTWEAR factory within 50 miles of New York, 23,500 square feet floor space: 500-horsepower boilers and engines, with little additional machinery, a fully equipped tire factory, able to turn out 100 tires and tubes per day. Can purchase an interest in the company. Henry S. Mott Co., 367 Fulton street, Brooklyn, Main 4067. (4838)

WANTED: TO BUY OR RENT RUBBER PLANT, OR TO RENT mill, calender, and press for 16-inch square mold, with about 1,000 square feet floor space. Will furnish own tools and supplies if desired. Location must be in or near New York City. Address Box No. 4832, care of THE INDIA RUBBER WORLD.

EXPERT RECLAIMER WISHES TO CONNECT WITH SOME ONE with some capital to start in reclaiming or other line. Years of experience manufacturing, buying and selling. Have a little money to invest. Confidential. Address Box No. 4821, care of THE INDIA RUBBER WORLD.

K. & S. Tire and Rubber Goods, Limited

PREFERRED DIVIDEND No. 3

Notice is hereby given that a dividend of one and three-quarters per cent. (1 3/4%) on preferred stock of this company for the quarter ending June 30th, 1920 (being at the rate of 7% per annum) has been declared, payable July 15th, 1920, to shareholders of record June 30th, 1920.

By order of the Board.

J. A. THOMPSON, Secretary.
(4808)

BUSINESS OPPORTUNITIES—Continued

WELL KNOWN FIRM IN ENGLAND WITH EXTENSIVE CONNECTIONS in rubber industry open to sell anything for this or allied industries—chemicals excepted. Address Box No. 4805, care of THE INDIA RUBBER WORLD.

FOR SALE OR LEASE: UP-TO-DATE RUBBER PLANT. ADDRESS Box No. 4809, care of THE INDIA RUBBER WORLD.

Consulting Rubber Technologist

Service based on experience and scientific training. Reports on machines, processes and products of rubber industry. Best American practice in compounding for tires, shoes, mechanicals, specialties, etc. Cable address: "Contrubtec," New York. Code A B C Fifth Edition.

WEBSTER NORRIS

409 WASHINGTON AVE.

BROOKLYN, N. Y.

WE BUY INFORMING ARTICLES WRITTEN BY experienced rubber men, on all subjects of interest to the rubber industry relating to manufacturing processes, chemistry, factory management, cost accounting and industrial relations. Manuscripts submitted for approval will receive prompt consideration. Address Box No. 4791, care of The India Rubber World.

RUBBER COMPOUNDS AND EXPERT ADVICE FOR CORD AND pneumatic tires; also inner tubes, solid tires complete. Non-blooming and quick-cure repair stocks, cements, waterproofing and mechanicals. Everything in rubber. Write for our complete list. Best of bank references. Rubber Compound Bureau, 727 Second National Bank Building, Akron, Ohio. (3664)

Capable and Experienced

EXECUTIVE CAN SECURE POSITION

as secretary and treasurer of middle west factory manufacturing dipped goods. One having knowledge of making molded goods will be given preference. An investment of \$5,000 to \$10,000 required. Good opportunity and future to right party. For further details address Box No. 4801, care of The India Rubber World.

(Advertisements continued on page 84)

Expert — Car Tyres — Wanted

Largest Scandinavian firm of rubber manufacturers wants expert for the manufacturing of car tyres. Excellent position to the right man. Absolutely first class testimonials, long experience and a keen knowledge of every detail in the manufacture of car tyres, guaranteeing superior workmanship, is essential. Apply to "No. 3397," Gumaelius Ltd., 11 Arundel street, Strand, London, W.C.2, England, giving full particulars which will be treated strictly in confidence.

(4571)

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Cotton Fabrics and Yarns

The Equitable Trust Building, Madison Ave. and 45th St., New York City

Cord Yarn and Cord Fabric for Cord Tires

All yarn and fabric constructions, in Peeler, Egyptian and Sea Island.

E. D. Hewins, Inc.

72 Lincoln Street, Boston, Mass.

New York Office, 280 BROADWAY

*Special Fabrics for the
Rubber Trade*

BRANDER & CURRY

INCORPORATED

FORTY-SECOND STREET BUILDING,
NEW YORK, U. S. A.

SEA ISLAND, EGYPTIAN AND PEELER

TIRE FABRICS

CHAFING STRIPS AND LENO BREAKERS

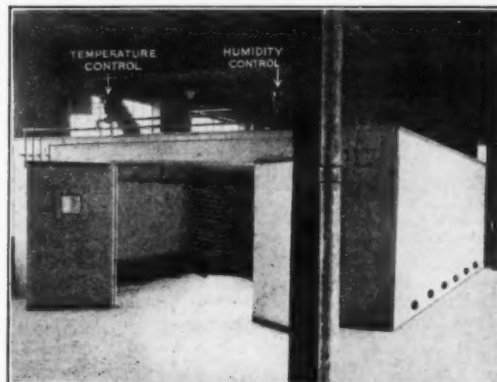
CORD YARNS AND CORD FAB-
RICS, SHEETINGS AND DRILLS

FOR AUTOMOBILE AND RUBBER TRADE A SPECIALTY

GOLDEN CRIMSON VERMILLION
ANTIMONY SULPHURET
15%-17% FREE SULPHUR

THE HARSHAW FULLER AND GOODWIN CO.

New York Cleveland Philadelphia Chicago



Common Sense and Now Common Practice

It is now a very simple matter to dry thousands of pounds of rubber in a few hours and actually benefit the material in the drying by using The Hunter Patent Process.

No energy or time is consumed in changing from one grade to another. Rubbers such as caucho-ball, fine and plantation stock can be dried in the same charge.

In developing the Hunter System of Drying Rubber the aim has been to work towards simplicity, keeping always in mind the common sense principles employed by Nature.

These principles involve not only the proper use of circulation and temperature but also the heretofore neglected but very important element of humidity.

The conditions as to temperature and humidity are automatically produced and controlled, making the system self operative.

Why not make this end of your production a simple matter? Hundreds of others in your line have done so.

The Hunter Dry Kiln Co.

Home Office and Laboratory

26th Street and Cornell Avenue
Indianapolis, Ind.

Eastern Office

Kinney Building, Newark, N. J.



BUSINESS OPPORTUNITIES—Continued

CORRESPONDENCE INVITED WITH FIRMS CAPABLE OF MAKING special molded disks for hot and cold water service and steam service, to be used in faucets and valves. Address Box No. 4833, care of THE INDIA RUBBER WORLD.

WE WILL PAY 25 CENTS EACH FOR PERFECT copies of the following numbers: 1920—February, March; 1919—February, March, April, July and October; 1918—October; 1916—January. The India Rubber World, 25 West 45th Street, New York City.

WE BUY INFORMING ARTICLES WRITTEN BY experienced tire repair men on subjects relating to the rebuilding and repair of pneumatic and solid tires. Manuscripts submitted for approval will receive prompt attention. Address Box No. 4792, care of The India Rubber World.

FOR SALE Tire and Sundries Plant

Located on the main line of the Pennsylvania railroad only 50 miles south of Akron, Ohio, in a small town of about 2,500 population, in which there is plenty of excellent labor available, plenty of good water, abundance of coal can be had from local mines, railroad siding right in to the plant.

Two buildings one story each. One 300 feet long, 100 feet wide, other 300 feet long by 50 feet. Constructed of concrete and steel. Good light and ventilation. Equipment as follows: Two 150-h.-p. Erie boilers, two boiler feed pumps, one large service pump, one duplex hydraulic pump (2,000 pounds), one tank type accumulator, 300-k.-w. direct-connected electric generator, 115-230 volts, Ingersoll-Rand air compressor and receiver, one 16 by 36-inch washer. Two 20 by 22 by 60-inch mills. Complete with transmission and motor. One 24 by 66-inch calendar, herringbone gears throughout complete with 90-h.-p. motor, transmission, and Cutler-Hammer automatic control board. About 75 assorted calendar shells. Four 48 by 72-inch Thropp tire vulcanizers. Two Thropp tire wrapping machines. One 4-opening bead press with lift table. One 44 by 44-inch press. Three 24 by 24-inch double-opening hydraulic presses. One 15 by 20-inch hand press. One 3-inch Allen tubing machine, one 48 by 12-inch Allen horizontal vulcanizer complete with rails, track, carriage, and spacing bars. One Allen skiving machine. Rag rollers, buffing stands, 200 tube mandrels, 20 tire building stands, tire trucks, racks, etc. One cement churn. One compound sifter. Complete set of Toledo automatic scales. Tire paper wrapper machine. Very complete small machine shop, consisting of lathe, drill press, power saw, forge, anvil, complete set of pipe-threading dies and small tools. Complete set of office furniture, cutting tables, racks, etc. The core and mold equipment at present consists of about 80 cores and 40 pairs of side flanges for wrapped-tread tires.

The plant is well stocked with raw materials such as rubber, compounds, fabric, bead wire, etc., so that production could be started without delay.

For further particulars communicate with

J. S. KOHN, Receiver

214 Engineers Building, Cleveland, Ohio

(4816)

MACHINERY AND SUPPLIES WANTED

COMPOUND OF HIGH GRADE FABRIC TIRES AND inner tubes, cord tires cured on the core or air bag. Mechanical stocks of all kinds. Expert in curing tires. Can give reliable information on machine process and raw material. We have experts, men who can come in and eliminate any difficulty you may have. Also establish cost system. Best references from those whom we have served. Ohio Consulting Engineer, 116 St. Claire street, Elyria, Ohio. (4734)

(Advertisements Continued on Page 86)

JOHN BOYLE, Jr. ATTORNEY AT LAW **PATENTS**

Sixteen years in the examining corps of the United States Patent Office, with special experience in chemical and metallurgical inventions and interferences.

OURAY BUILDING

WASHINGTON, D. C.

The Efficiency Rubber Gauge (The Randall and Stickney Thickness Gauge)

With this Gauge the thickness of rubber is determined within .001 inch, and there is no personal factor to be considered.



This instrument has been in use by the leading Rubber Manufacturers of this country and Canada for fifteen years.

Operated by a Standard Pressure on a Standard Area
Send for Descriptive Circular and Prices

FRANK E. RANDALL, Waltham, Mass.

MANDRELS**"Shelby Special"**

WE SPECIALIZE in grinding and treating old steel poles. See us before discarding and purchasing new ones.



We supply and insert plugs at a nominal charge. WRITE FOR CATALOG GIVING FULL PARTICULARS.

All Highly Polished, Sherardized and Buffed. Produce 100% Perfect Auto Inner Tubes
WE ISSUE A MONTHLY STOCK LIST. IF WE HAVE OVERLOOKED YOU, WRITE US

THE NEW HAVEN SHERARDIZING CO. 868 Windsor St., Hartford, Conn.

Representatives, W. E. Wilson, of Akron Rubber Mold and Machine Co., Akron, O. Biggs Boiler Works, Akron, O. Canadian Representative, Lyman Tube & Supply Company, Toronto, Ont.

European Representative, Peter A. Frasse & Company, 417 Canal Street, New York, N. Y.

TYPKE & KING, Ltd.,

Head Offices
and
Works

Crown Chemical Works
Commonside East, Mitcham, England

ESTABLISHED 1883

ESTABLISHED 1883

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Small Advertisement Department—Continued.

MACHINERY AND SUPPLIES WANTED (Cont.)

WANTED: ONE EACH ROYLE NO. 2 AND NO. 3 TUBING MACHINES in first-class condition. Motor drive preferred. Address Box No. 4843, care of THE INDIA RUBBER WORLD.

WANTED: ONE NO. 4 SECOND-HAND PERFECTED TUBING machine manufactured by John Royle & Sons. Address Kokomo Rubber Co., Kokomo, Indiana. (4836)

WANTED: ONE FIFTY-INCH AND ONE SIXTY-INCH SPREADER. Address Box No. 4800, care of THE INDIA RUBBER WORLD.

WANTED: 20 BY 20 OR 24 BY 24 HYDRAULIC PRESSES GOOD FOR 2,000 pounds' pressure. T. L. Lussen, 30 West State street, Akron, Ohio. (4815)

WE ARE ALWAYS IN THE MARKET FOR EGYPTIAN COTTON TIRE fabric. Expect offers. Azteca S. A., P. O. Box 5623, Mexico, D. F. (4705)

WANTED: VACUUM SHELF DRYERS. W. P. HEINEKEN, ENGINEER, 95 Liberty street, New York City. (4660)

WE ARE IN THE MARKET FOR 15.1-OUNCE 48-INCH COMBED Peeler and combed Egyptian cord fabric also 17 1/4-ounce 48-inch carded Peeler and combed peeler tire building fabric. Address Box No. 4798, care of THE INDIA RUBBER WORLD.

WANTED: TWO 40- OR 36-INCH MILLS WITH OR WITHOUT DRIVE and motor.
One 24-inch mill.
Two No. 1 Royle tubers.

Quote price and where located. Address Box No. 4794, care of THE INDIA RUBBER WORLD.

MACHINERY AND SUPPLIES FOR SALE

FOR SALE: ONE BIRMINGHAM CALENDER, 3-ROLL, 20 BY 52 inches. Address Box No. 4835, care of THE INDIA RUBBER WORLD.

FOR SALE: ONE BASSETT PERPENDICULAR FABRIC-TESTING machine. Pennsylvania Rubber Co., Jeannette, Pa. (4806)

FOR SALE: TEN COMPLETE CIRCLE, SINGLE-CURE, AIR-BAG system, steam-jacketed, tire-rebuilding molds. Complete with all fittings, overhead track, etc. Also Miller standard factory wrapping machine, complete with spools and winder. Auerbach, 976 Bushwick avenue, Brooklyn, New York.

FOR SALE: One 18 BY 48-INCH BIRMINGHAM CALENDER, ONE 16 BY 24-inch Birmingham mill, complete, with drive, motor and switchboard; one 13 BY 30-inch mill; one 16 BY 30-inch cracker or washer. Address Box No. 4810, care of THE INDIA RUBBER WORLD.

FOR SALE: ONE NEW 24 BY 66-INCH 3-ROLL CALENDER COMPLETE with motor control and drive.

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FOR SALE: NEW AND USED ELECTRICAL MACHINERY FOR RUBBER plants. See our advertisement, page No. 20. The Electric Motor & Repair Co., Akron, Ohio. (3917)

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FOR SALE: ONE ACCUMULATOR; TWO DIEING-OUT MACHINES suitable for heels or soles; one Clark tubing machine. Address Box No. 4812, care of THE INDIA RUBBER WORLD.

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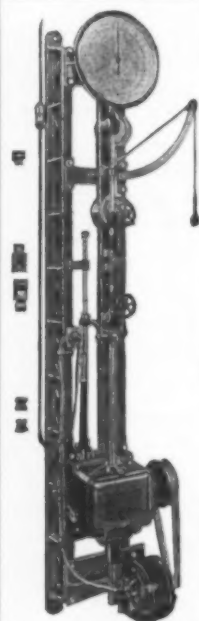
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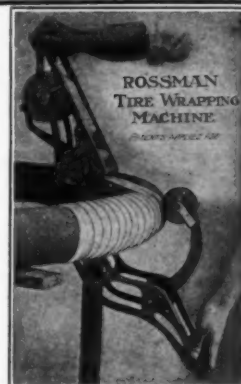
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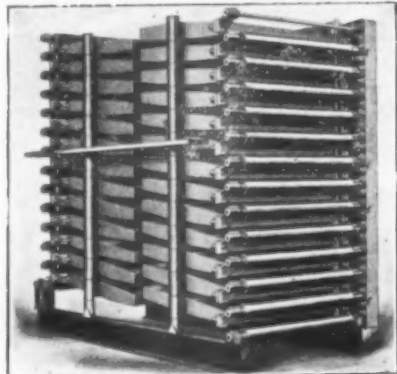
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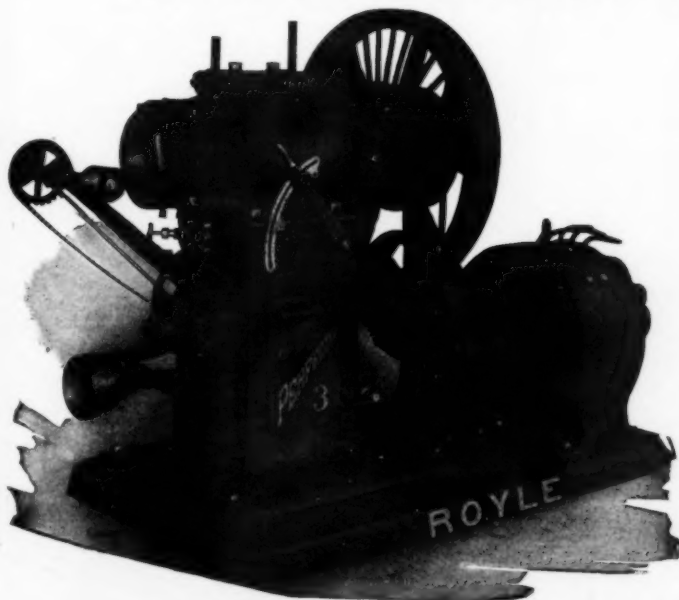
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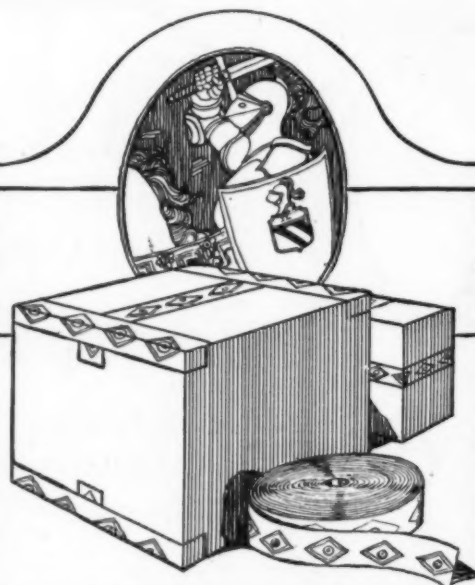
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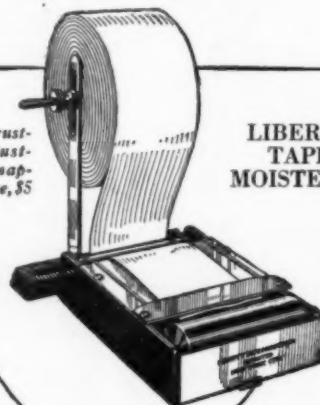
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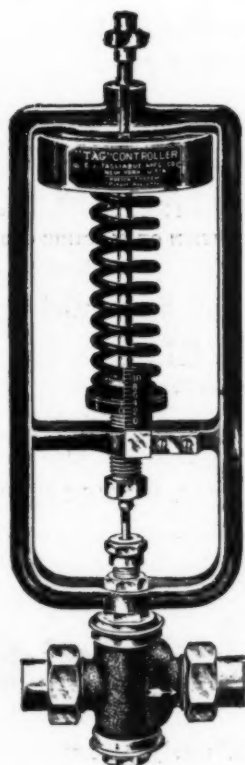
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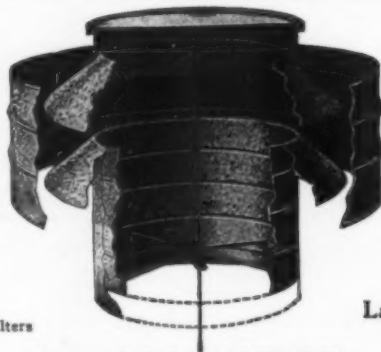
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Canfield Rubber Co., Bridgeport, Conn.
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Gutta Percha and Rubber, Limited, Toronto, Canada.
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Home Rubber Co., Trenton, N. J.
Inland Rubber Co., Chicago, Ill.
Manhattan Rubber Mfg. Co., Passaic, N. J.
N. J. Car Spring & Rubber Co., Jersey City, N. J.
New York Belting & Packing Co., N. Y.
New York Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
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Pirelli & Co., Milan, Italy.
Plymouth Rubber Co., Canton, Mass.
Quaker City Rubber Co., Phila., Pa.
Rubber Products Co., Barberton, Ohio.
Stokes, Jos., Rubber Co., Trenton, N. J.

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United & Globe Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.
Western Rubber Co., Goshen, Ind.
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Woven Steel Hose & Rubber Co., Trenton, N. J.

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Perfection Tire & Rubber Co., Ft. Madison, Iowa.
Raybestos Co., The Bridgeport, Conn.
Robert, J. W., Ltd., Armley, England.

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Raybestos Co., The Bridgeport, Conn.

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Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati Rubber Mfg. Co., Cincinnati, O.
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Gutta Percha & Rubber Mfg. Co., New York, N. Y.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
N. J. Car Spring & Rubber Co., Jersey City, N. J.
New York Belting & Packing Co., New York.
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United States Rubber Co., New York.
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Manhattan Rubber Mfg. Co., Passaic, N. J.
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United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.

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Canfield Rubber Co., Bridgeport, Conn.
Cincinnati R. M. Co., Cincinnati, O.
Clifton Mfg. Co., Boston, Mass.
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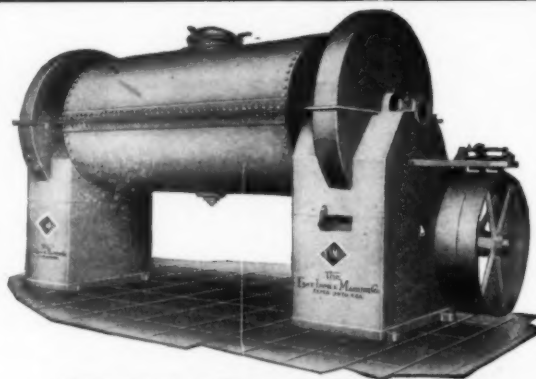
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North British Rubber Co., Ltd., Edinburgh, Scotland.
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Canfield Rubber Co., Bridgeport, Conn.
Cincinnati Rubber Mfg. Co., Cincinnati, Ohio.
Continental Rubber Works, Erie, Pa.
Goodrich, B. F., Co., The, Akron, O.
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Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
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Western Rubber Co., Goshen, Ind.

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Essex Rubber Co., Trenton, N. J.

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Goodrich, B. F., Co., The, Akron.
Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
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Home Rubber Co., Trenton, N. J.
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North British Rubber Co., Ltd., Edinburgh, Scotland.
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Cincinnati Rubber Mfg. Co., Cincinnati, Ohio.
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Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Continental Rubber Works, Erie, Pa.
Goodrich, B. F., Co., The, Akron, O.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
N. J. Car Spring & Rubber Co., Jersey City, N. J.
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United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.

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Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati R. M. Co., Cincinnati, O.
Continental Rubber Works, Erie, Pa.
Essex Rubber Co., Trenton, N. J.
Foster Rubber Co., Boston.
Goodrich, B. F., Co., The, Akron.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Plymouth Rubber Co., Canton, Mass.
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General Exporters and Importers

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280 Broadway

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CARBON BLACK

Made by

GODFREY L. CABOT

938-942 Old South Building, Boston, Mass.

8 Factories: 6 SHIPPING POINTS, viz, Owensport, Nancys Run, Cedar Grove and Clendenin, W. Va., and Howard and Lamkin, La.

STOCKS carried at New York, Chicago, St. Louis, San Francisco, London, Paris, etc.

GRADES: Elf, Auk, Monarch, Kalista, Vulcan, Kosmos No. 1 and Kosmos No. 2, etc.

Send for Samples and Prices.

RUBBER BUYERS' DIRECTORY—Continued.

Hose—Rubber—Continued.

Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha & Rubber, Ltd., Toronto.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
N. J. Car Spring & Rubber Co., Jersey City, N. J.
New York Belting & Packing Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Schrader's, A., Son, Inc., Brooklyn, N. Y.
Thermoid Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Western Rubber Co., Goshen, Ind.
Whitehead Bros. Rubber Co., Trenton, N. J.
Woven Steel Hose & Rubber Co., Trenton, N. J.

Hose Pipes, Nozzles, Couplings, Clamps, Fittings, Racks and Reels.

Allen, W. D., Mfg. Co., Chicago.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Gutta Percha & Rubber Mfg. Co., N. Y.
Manhattan Rubber Mfg. Co., Passaic, N. J.
N. Y. Belting & Packing Co., New York.
Sherman, H. B., Mfg. Co., Battle Creek, Mich.
Southwark Foundry & Machine Co., Philadelphia, Pa.
United States Rubber Co., New York.
Woven Steel Hose & Rubber Co., Trenton, N. J.

Hose—Rubber Lined.**Cotton and Linen.**

Acme Rubber Mfg. Co., Trenton, N. J.
Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati Rubber Mfg. Co., Cincinnati, O.
Fabric Fire Hose Co., New York.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha & Rubber Mfg. Co., N. Y.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
N. J. Car Spring & Rubber Co., Jersey City, N. J.
New York Belting & Packing Co., N. Y.
New York Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Stokes, Jos., Rubber Co., Trenton, N. J.
United & Globe Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Whitehead Bros. Rubber Co., Trenton, N. J.
Woven Steel Hose & Rubber Co., Trenton, N. J.

Hose Linings.

Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Manhattan Rubber Mfg. Co., Passaic, N. J.

Hose Linings—Continued.

N. J. Car Spring & Rubber Co., Jersey City, N. J.
New York Belting & Packing Co., New York.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.

Lawn-Hose Supporters.

Allen, W. D., Mfg. Co., Chicago.

Lawn Sprinklers.

Allen, W. D., Mfg. Co., Chicago.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.

Mallets (Rubber).

Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Continental Rubber Works, Erie, Pa.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

Matting—Carriage Mats and Stair Treads.

Acme Rubber Mfg. Co., Trenton, N. J.
Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati R. M. Co., Cincinnati, O.
Continental Rubber Works, Erie, Pa.

Matting—Carriage Mats and Stair Treads—Continued.

Essex Rubber Co., Trenton, N. J.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Hodgman Rubber Co., New York.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
N. J. Car Spring & Rubber Co., Jersey City, N. J.
New York Belting & Packing Co., N. Y.
New York Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Western Rubber Co., Goshen, Ind.

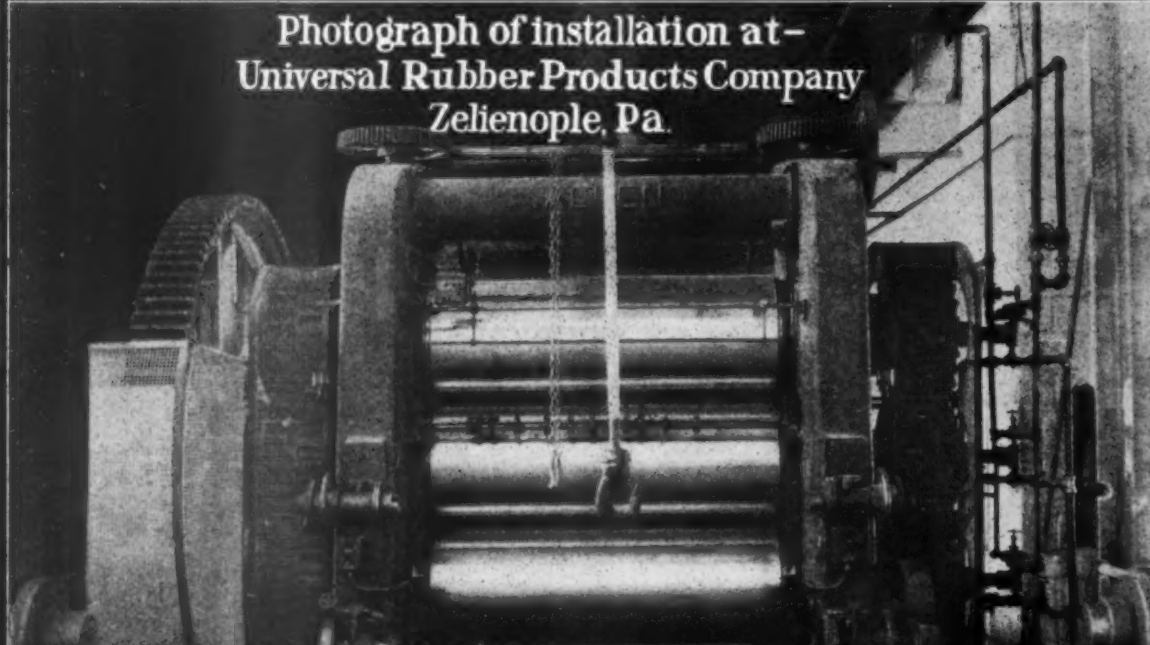
Mold Work.

(See Mechanical Rubber Goods.)

Acme Rubber Mfg. Co., Trenton, N. J.
Archer-Strauss Rubber Co., Framingham, Mass.
Boston Belting Co., Boston, Mass.
Canfield, H. O., Co., Bridgeport, Conn.
Canfield Rubber Co., Bridgeport, Conn.
Cincinnati R. M. Co., Cincinnati, O.
Clifton Manufacturing Co., Boston, Mass.
Continental Rubber Works, Erie, Pa.
Davidson Rubber Co., Boston, Mass.
David Rubber Co., Providence, R. I.
Elkhart Rubber Works, Elkhart, Ind.
Essex Rubber Co., Trenton, N. J.
Goodrich, B. F., Co., The, Akron, Ohio.
Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha & Rubber, Ltd., Toronto.
Hale, Alfred, Rubber Co., Atlantic, Mass.
Hewitt Rubber Co., Buffalo, N. Y.
Hodgman Rubber Co., New York.
Home Rubber Co., Trenton, N. J.

(For Complete Addresses See Advertisements—Index Pages 95-97.)

**Photograph of installation at—
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Zelienople, Pa.**



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RUBBER BUYERS' DIRECTORY—Continued.

Mold Work—Continued.

Manhattan Rubber Mfg. Co., Passaic, N. J.
 Miller Rubber Co., Akron, O.
 N. J. Car Spring & Rubber Co., Jersey City, N. J.
 New York Belting & Packing Co., New York.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 Plymouth Rubber Co., Canton, Mass.
 Quaker City Rubber Co., Philadelphia.
 Rubber Products Co., Barberton, O.
 Standard Tire & Rubber Manufacturing Co., Cleveland, Ohio.
 Tye Rubber Co., Andover, Mass.
 United & Globe Rubber Co., Trenton, N. J.
 United States Rubber Co., New York.
 Western Rubber Co., Goshen, Ind.
 Whitall Tatum Co., New York.

Oil Well Supplies.

Boston Belting Co., Boston, Mass.
 Boston Woven Hose & Rubber Co., Cambridge, Mass.
 Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Continental Rubber Works, Erie, Pa.
 Electric Hose & Rubber Co., Wilmington, Del.
 Goodrich, B. F., Co., The, Akron, O.
 Gutta Percha & Rubber Mfg. Co., N. Y.
 Gutta Percha and Rubber, Limited, Toronto, Canada.
 Hewitt Rubber Co., Buffalo, N. Y.
 Home Rubber Co., Trenton, N. J.
 Manhattan Rubber Mfg. Co., Passaic, N. J.
 N. J. Car Spring & Rubber Co., Jersey City.
 New York Belting & Packing Co., N. Y.
 Quaker City Rubber Co., Philadelphia, Pa.
 United & Globe Rubber Co., Trenton, N. J.
 United States Rubber Co., New York.
 Voorhees Rubber Mfg. Co., Jersey City.
 Western Rubber Co., Goshen, Ind.

Packing.

(See Mechanical Rubber Goods.)

Boston Belting Co., Boston, Mass.
 Boston Woven Hose & Rubber Co., Cambridge, Mass.
 Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Cincinnati Rubber Mfg. Co., Cincinnati, O.
 Continental Rubber Works, Erie, Pa.
 Elkhart Rubber Works, Elkhart, Ind.
 Essex Rubber Co., Trenton, N. J.
 Goodrich, B. F., Co., The, Akron, Ohio.
 Gutta Percha & Rubber Mfg. Co., New York.
 Gutta Percha and Rubber, Limited, Toronto, Canada.
 Hewitt Rubber Co., Buffalo, N. Y.
 Home Rubber Co., Trenton, N. J.
 Manhattan Rubber Mfg. Co., Passaic, N. J.
 N. J. Car Spring & Rubber Co., Jersey City, N. J.
 New York Belting & Packing Co., New York.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 Quaker City Rubber Co., Philadelphia, Pa.
 Raybestos Co., The, Bridgeport, Conn.
 Robert, J. W., Ltd., Armley, England.
 United & Globe Rubber Co., Trenton, N. J.
 United States Rubber Co., New York.
 Western Rubber Co., Goshen, Ind.
 Whitehead Bros. Rubber Co., Trenton, N. J.

Packing—Asbestos.

General Asbestos & Rubber Co., Charleston, S. C.
 Perfection Tire & Rubber Co., Ft. Madison, Iowa.
 Raybestos Co., The, Bridgeport, Conn.

Paper Machine Rolls and Deckle Straps.

Boston Belting Co., Boston, Mass.
 Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.

Paper Machine Rolls and Deckle Straps—Continued.

Goodrich, B. F., Co., The, Akron, O.
 Gutta Percha & Rubber Mfg. Co., N. Y.
 Manhattan Rubber Mfg. Co., Passaic, N. J.
 New York Belting & Packing Co., N. Y.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 United States Rubber Co., New York.
 Voorhees Rubber Mfg. Co., Jersey City.

Plumbers' Supplies.
Force Cups, Fuller Balls.

Acme Rubber Mfg. Co., Trenton, N. J.
 Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Canfield Co., H. O., Bridgeport, Conn.
 Canfield Rubber Co., Bridgeport, Conn.
 Continental Rubber Works, Erie, Pa.
 Elkhart Rubber Works, Elkhart, Ind.
 Essex Rubber Co., Trenton, N. J.
 Goodrich, B. F., Co., The, Akron, O.
 Gutta Percha and Rubber, Limited, Toronto, Canada.
 Hodgman Rubber Co., New York.
 Home Rubber Co., Trenton, N. J.
 N. J. Car Spring & Rubber Co., Jersey City, N. J.
 New York Belting & Packing Co., N. Y.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 Quaker City Rubber Co., Philadelphia, Pa.
 Rubber Products Co., Barberton, O.
 United States Rubber Co., New York.
 Voorhees Rubber Mfg. Co., Jersey City.
 Western Rubber Co., Goshen, Ind.

Rolls—Rubber Covered.

Acme Rubber Mfg. Co., Trenton, N. J.
 Boston Belting Co., Boston, Mass.
 Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Cincinnati R. M. Co., Cincinnati, O.
 Clifton Manufacturing Co., Boston.
 Continental Rubber Works, Erie, Pa.

Rolls—Rubber Covered—Cont.

Goodrich, B. F., Co., The, Akron, O.
 Gutta Percha & Rubber Mfg. Co., N. Y.
 Gutta Percha and Rubber, Limited, Toronto, Canada.
 Home Rubber Co., Trenton, N. J.
 Manhattan Rubber Mfg. Co., Passaic, N. J.
 Miller Rubber Co., Akron, O.
 N. J. Car Spring & Rubber Co., Jersey City, N. J.
 New York Belting & Packing Co., N. Y.
 North British Rubber Co., Ltd., Edinburgh, Scotland.
 Plymouth Rubber Co., Canton, Mass.
 Quaker City Rubber Co., Philadelphia, Pa.
 United States Rubber Co., New York.
 Voorhees Rubber Mfg. Co., Jersey City, N. J.
 Western Rubber Co., Goshen, Ind.

Sewing Machine Rubbers.

Canfield Rubber Co., Bridgeport, Conn.
 Continental Rubber Works, Erie, Pa.
 Goodrich, B. F., Co., The, Akron, O.
 Manhattan Rubber Mfg. Co., Passaic, N. J.
 Western Rubber Co., Goshen, Ind.

Specialties.

Davol Rubber Co., Providence, B. I.
 Goodrich, B. F., Co., The, Akron, O.
 Indiana Insulated Wire & Cable Co., Jonesboro, Ind.
 Manhattan Rubber Mfg. Co., Passaic, N. J.

Tiling.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
 Continental Rubber Works, Erie, Pa.
 Gutta Percha and Rubber, Limited, Toronto, Canada.
 Hewitt Rubber Co., Buffalo, N. Y.
 New York Belting & Packing Co., N. Y.
 North British Rubber Co., Ltd., Edinburgh.

(For Complete Addresses See Advertisements—Index Pages 95-97.)

MAGNESIA



DOUBLE CALCINED HEAVY
MEDIUM LIGHT CALCINED
LIGHT CALCINED
EXTRA LIGHT CALCINED
CARBONATE

Specially Adapted for the Rubber Trade

**GENERAL MAGNESITE
 & MAGNESIA COMPANY**
PHILADELPHIA



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Carbonate

LIGHT

MAGNESIA

HEAVY

By exercising the utmost care in selection of raw materials which our Principals own or control by long lease we can supply a superior MAGNESIA at a better price. INVITE our competition. REQUEST samples and quotations on your spot and contract requirements.



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CHEMICALS

Cleveland

Ohio



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The Massachusetts Institute of Technology is authority for the following statement:

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THE NEW JERSEY ZINC COMPANY, 160 Front Street, New York
ESTABLISHED 1848

CHICAGO: Mineral Point Zinc Company, 1111 Marquette Building.
PITTSBURGH: The New Jersey Zinc Co. (of Pa.), 1439 Oliver Building.

RUBBER BUYERS' DIRECTORY—Continued.

Tiling—Continued.

United & Globe Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Western Rubber Co., Goshen, Ind.

Tubing.

(See Mechanical Rubber Goods.)

Acme Rubber Mfg. Co., Trenton, N. J.
American Hard Rubber Co., New York.
Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Cincinnati R. M. Co., Cincinnati, O.
Continental Rubber Works, Erie, Pa.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Eclat Rubber Co., Cuyahoga Falls, Ohio.
Electric Hose & Rubber Co., Wilmington, Del.
Essex Rubber Co., Trenton, N. J.
Faultless Rubber Co., Ashland, Ohio.
Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Hodgman Rubber Co., New York.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Miller Rubber Co., Akron, O.
Mutt, L. J., Co., Boston, Mass.
N. J. Car Spring & Rubber Co., Jersey City, N. J.
New York Belting & Packing Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Rubber Products Co., Barberton, O.
Tyer Rubber Co., Andover, Mass.
United & Globe Rubber Co., Trenton, N. J.
United States Rubber Co., New York.

Tubing—Continued.

Voorhees Rubber Mfg. Co., Jersey City, N. J.
Western Rubber Co., Goshen, Ind.
Whitall Tatum Co., New York.
Whitehead Bros. Rubber Co., Trenton, N. J.

Valve Discs.

American Hard Rubber Co., New York.
Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Cincinnati R. M. Co., Cincinnati, O.
Continental Rubber Works, Erie, Pa.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

Valves.

(See Mechanical Rubber Goods.)

Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Elkhart Rubber Works, Elkhart, Ind.
Essex Rubber Co., Trenton, N. J.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Manhattan Rubber Mfg. Co., Passaic, N. J.
N. J. Car Spring & Rubber Co., Jersey City, N. J.
New York Belting & Packing Co., New York.

Valves—Continued.

New York Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
United & Globe Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.
Whitehead Bros. Rubber Co., Trenton, N. J.

Valves—Balata.

Boston Belting Co., Boston, Mass.

Valves, Balls—Condensor, Cold and Hot Water.

Boston Belting Co., Boston, Mass.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Western Rubber Co., Goshen, Ind.

Vulcanite Emery Wheels.

Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
United States Rubber Co., New York.

Wringer Rolls.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati R. M. Co., Cincinnati, O.
Continental Rubber Works, Erie, Pa.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha and Rubber, Limited, Toronto.
Home Rubber Co., Trenton, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

DRUGGISTS' AND STATIONERS' SUNDRIES.

Atomizers.

Bandages.

Bulbs.

Nipples.

Syringes.

Water Bottles.

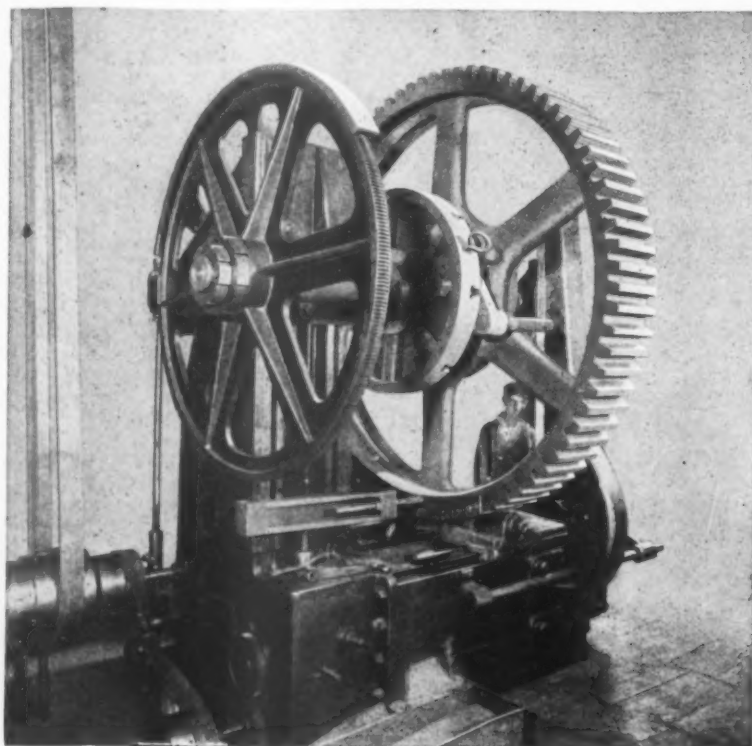
Druggists' Sundries, Generally.

American Hard Rubber Co., New York.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Goodrich, B. F., Co., The, Akron, Ohio.
Hodgman Rubber Co., New York.
Miller Rubber Co., Akron, O.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Pirelli & Co., Milan, Italy.
Rubber Products Co., Barberton, O.
Seamless Rubber Co., Inc., New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
Vulcanized Rubber Co., New York.
Whitall Tatum Co., New York.

Air Goods.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.
Whitall Tatum Co., N. Y.

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Cutting Teeth in Large Steel Bull Gear

Sixty Years' Experience

In the manufacture of heavy gearing, friction clutches and bearings for rubber mill service. We make machine molded, cast or cut tooth gears from our heavy patterns, also bridge tree bearings and other repairs for rubber mills on short notice.

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EXCLUSIVELY

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Worcester, Mass.

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Works: *Italy*—Milan
Bicocca
Spezia
Vercurago

Spain—Villanueva y Geltrù
(near Barcelona)

England—Southampton

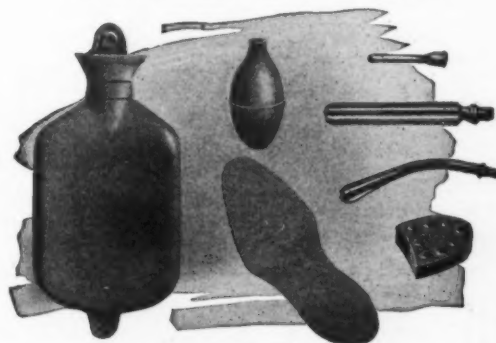
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Die Sinkers and Engravers. Medallion Dies a Specialty.

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YOUR INQUIRIES SOLICITED

William H. Stiles & Co.

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IMPORTERS and MERCHANTS

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RUBBER BUYERS' DIRECTORY—Continued.

Air Goods—Valves for.

Schrader's, A., Son, Inc., New York.

Balloons (Toy).Faultless Rubber Co., Ashland, Ohio.
Miller Rubber Co., Akron, Ohio.**Balls, Dolls and Toys.**Daval Rubber Co., Providence, R. I.
Essex Rubber Co., Trenton, N. J.
Faultless Rubber Co., Ashland, Ohio.
New York Rubber Co., New York.
United States Rubber Co., New York.**Bathing Caps.**Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Daval Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Hodgman Rubber Co., New York.
Miller Rubber Co., Akron, O.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Rubber Products Co., Barberton, O.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.**Bulbs.**Davidson Rubber Co., Boston, Mass.
Faultless Rubber Co., Ashland, Ohio.
Goodrich, B. F., Co., The, Akron, Ohio.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.
Whitall Tatum Co., New York.**Combination Fountain Syringe and Hot Water Bottle Fixtures.**

Schrader's, A., Son, Inc., New York.

Combs.American Hard Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Vulcanized Rubber Co., New York.**Elastic Bands.**Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Daval Rubber Co., Providence, R. I.
Easthampton Rubber Thread Co., Easthampton, Mass.
Goodrich, B. F., Co., The, Akron, O.
Hale, Alfred, Rubber Co., Boston, Mass.
Hodgman Rubber Co., New York.
Seamless Rubber Co., Inc., New Haven, Conn.
Tyler Rubber Co., Andover, Mass.
United States Rubber Co., New York.**Electricians' and Surgeons' Gloves.**Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davidson Rubber Co., Boston, Mass.
Daval Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Goodrich, B. F., Co., The, Akron, O.
Hodgman Rubber Co., New York.
Mathias-Hart Co., Boston, Mass.
Miller Rubber Co., The, Akron, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Rubber Products Co., Barberton, O.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.**Erasive Rubbers.**Faultless Rubber Co., Ashland, Ohio.
Goodrich, B. F., Co., The, Akron, O.
North British Rubber Co., Ltd., Edinburgh, Scotland.**Finger Cots.**Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Daval Rubber Co., Providence.
Faultless Rubber Co., Ashland, Ohio.
Goodrich, B. F., Co., The, Akron, O.
Hodgman Rubber Co., New York.
Miller Rubber Co., Akron, O.
Rubber Products Co., The, Barberton, O.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.
Whitall Tatum Co., N. Y.**Gloves—Workmen's.**

McAdoo-Akron Co., Akron, Ohio.

Fountain Pens.

Davidson Rubber Co., Boston, Mass.

Gutta Percha Tissue.

Peters Bros. Rubber Co., New York.

Hard Rubber Goods.American Hard Rubber Co., New York.
Brunswick-Balke-Collender Co., Chicago, Ill.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davidson Rubber Co., Boston.
Daval Rubber Co., Providence, R. I.
Goodrich, B. F., Co., The, Akron, O.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Seamless Rubber Co., Inc., New Haven, Conn.
Stokes, Joseph, Rubber Co., Trenton, N. J.
Tyler Rubber Co., Andover, Mass.
Vulcanized Rubber Co., New York.
United States Rubber Co., New York.**Hospital Sheetings.**Archer Rubber Co., Milford, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Daval Rubber Co., Providence, R. I.
Goodrich, B. F., Co., The, Akron, Ohio.
Hale, Alfred, Rubber Co., Atlantic, Mass.**Hospital Sheetings—Continued.**Hodgman Rubber Co., New York.
Miller Rubber Co., The, Akron, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Plymouth Rubber Co., Canton, Mass.
Tyler Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Vulcan Proofing Co., Brooklyn, N. Y.**Hot Water Bottle Stopples.**

Schrader's, A., Sons, Inc., New York.

Hot Water Bottles, Throat Bags, Ice Bags and Ice Caps.Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davidson Rubber Co., Boston, Mass.
Daval Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Goodrich, B. F., Co., The, Akron, O.
Hodgman Rubber Co., New York.
Mathias-Hart Co., Boston, Mass.
Miller Rubber Co., The, Akron, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Rubber Products Co., The, Barberton, O.
Seamless Rubber Co., Inc., New Haven, Conn.
Tyler Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Whitall Tatum Co., N. Y.**Life Preservers.**Daval Rubber Co., Providence, R. I.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.**Nipples.**Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davidson Rubber Co., Boston, Mass.
Daval Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Hodgman Rubber Co., New York.
Miller Rubber Co., The, Akron, Ohio.

(For Complete Addresses See Advertisements—Index Pages 95-97.)

SOLVAY

A

Uniform WHITING



Solvay Whiting is sold with a guaranteed analysis as to the chemical constituents, fineness and uniformity.

It is entirely suitable for use in rubber compounds.

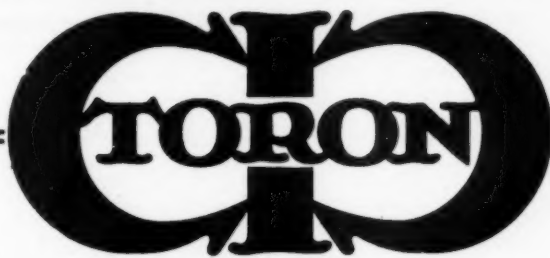
WING & EVANS, INC.

625 BOOK BUILDING DETROIT, MICH.

SALES AGENT FOR

THE SOLVAY PROCESS COMPANY.

MANUFACTURER OF ALKALI.



PAT-PENDING.

Fabrics Conditioned for Vulcanization

By treatment with a new non colloidal sulphur compound.

ADVANTAGES OF TORON TREATMENT:

1. Increased Tensile Strength.
2. Protection against oxidation.
3. Greater Flexibility.
4. Gives to fabrics an affinity for rubber.

Giving fabrics an affinity for rubber insures more uniform frictioning and eliminates skips; enables greater flow of rubber into interstices of fabrics producing higher friction pulls. In the case of cords it eliminates expensive and dangerous spreading process and gives better results than the latter.

SALMON FALLS MFG. CO.

50 STATE STREET

BOSTON, MASS.



FOR UNITING LEATHERS, RUBBER AND FABRICS

MONTGOMERY BROS., INC.

45 So. Second St.

PHILADELPHIA

FABRICS

For The Rubber Industry

A. L. PARDEE

512-513 Ohio Bldg.,

Akron, Ohio

Full Molded Cord Tires

Men prominent in the industry believe that cord tires will supercede fabrics altogether, and would have done so before this time had it been possible to vulcanize the cord tire as easily and cheaply as the fabric tire is cured, by the full mold system.

In attempting to cure the cord casing in the full mold, manufacturers generally have found that it is almost impossible to escape buckles, mold pinches, fabric distortions and bead injuries; and many different expensive and complicated methods have been resorted to in endeavoring to produce a satisfactory cord tire.

Working on the idea that the full molded system is the most economical and satisfactory method of vulcanizing, providing the objectionable features could be eliminated, the S. & B. Flexible Steel Mold was designed to cure casings on the core without injuries or distortions of any kind.

This flexible mold, recently perfected, is made to stand open at the beads when not under pressure, and the mold does not come in contact with the side-walls and beads of the casing but closes first at the tread—thereby avoiding all possibility of mold pinching. As the hydraulic pressure is applied the mold gradually comes in contact with the sides of the tire, forcing the surplus stock toward the beads and stretching the fabric taut around the core (as well as around the bead core)—thus removing all wrinkles or buckles from the carcass, and making a perfectly solid and well-formed bead.

**The Swinehart & Byrider
Process Co.**

212 Second National Building, AKRON, OHIO

RUBBER BUYERS' DIRECTORY—Continued.

Nipples—Continued.

North British Rubber Co., Ltd., Edinburgh, Scotland.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.
Whitall Tatum Co., N. Y.

Shower Bath Sprinklers.

Davol Rubber Co., Providence.
Hodgman Rubber Co., New York.
Schrader's, A. Son, Inc., New York.
Seamless Rubber Co., Inc., New Haven, Conn.

Sponges.

Faultless Rubber Co., Ashland, Ohio.
Fetheredge Rubber Co., Chicago, Ill.
Miller Rubber Co., The, Akron, Ohio.

Stationers' Sundries.

American Hard Rubber Co., New York.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati Rubber Mfg. Co., Cincinnati, Ohio.

Davidson Rubber Co., Boston.
Davol Rubber Co., Providence, R. I.
Goodrich, B. F., Co., The, Akron, O.
Hodgman Rubber Co., New York.
Miller Rubber Co., Akron, O.
Seamless Rubber Co., Inc., New Haven, Conn.

Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Stopples (Metal).

Schrader's, A. Son, Inc., New York.

Stopples (Rubber).

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Continental R. Works, Erie, Pa.
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., New York.

Stopples (Rubber)—Continued.

New York Belting & Packing Co., N. Y.
Seamless Rubber Co., Inc., New Haven, Conn.
Tyer Rubber Co., Andover, Mass.

Thread.

Easthampton Rubber Thread Co., Easthampton, Mass.
Goodrich, B. F., Co., The, Akron, O.
Mechanical Fabric Co., Providence, R. I.
United States Rubber Co., New York.

Tobacco Pouches.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
The B. F. Goodrich Co., Akron, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Rubber Products Co., The, Barberton, O.
Seamless Rubber Co., Inc., New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

MACKINTOSHED AND SURFACE GOODS.**Airplane and Balloon Cloths.**

Goodrich, B. F., Co., The, Akron, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

Air Mattresses.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davol Rubber Co., Providence, R. I.
Hale, Alfred, Rubber Co., Boston, Mass.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

Aprons—Rubber.

Archer Rubber Co., Milford, Mass.
Seamless Rubber Co., New Haven, Conn.

Barbers' Bibs.

Canfield Rubber Co., Bridgeport, Conn.
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., New York.
Miller Rubber Co., Akron, O.
Seamless Rubber Co., Inc., New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Bellows Cloths.

Archer Rubber Co., Milford, Mass.
Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Clifton Manufacturing Co., Boston, Mass.
Goodrich, B. F., Co., The, Akron, Ohio.
Hodgman Rubber Co., New York.
Plymouth Rubber Co., Canton, Mass.
United States Rubber Co., New York.

Blankets—Camp and Hospital.

Archer Rubber Co., Milford, Mass.
Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
du Pont, E. I., De Nemours & Co., New York.
Clifton Manufacturing Co., Boston, Mass.
Goodrich, B. F., Co., The, Akron, Ohio.
United States Rubber Co., New York.

Calendering.

Archer Rubber Co., Milford, Mass.
Canfield Rubber Co., Bridgeport, Conn.
Goodrich, B. F., Co., The, Akron, Ohio.
Hodgman Rubber Co., New York.
Plymouth Rubber Co., Canton, Mass.
United States Rubber Co., New York.

Carriage Ducks and Drills.

Acme Rubber Mfg. Co., Trenton, N. J.

Carriage Ducks and Drills.—Continued.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Clifton Manufacturing Co., Boston, Mass.
du Pont, E. I., de Nemours & Co., New York.
Empire Rubber & Tire Co., Trenton, N. J.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

Clothing and Mackintoshes.

Apsley Rubber Co., Hudson, Mass.
Archer Rubber Co., Milford, Mass.
Badger Raincoat Co., Fort Washington, Wis.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Clifton Mfg. Co., Boston, Mass.
du Pont, E. I., De Nemours & Co., New York.
Goodrich, B. F., Co., The, Akron, Ohio.
Hodgman Rubber Co., New York.
North British Rubber Co., Edinburgh, Scotland.
Pirelli & Co., Milan, Italy.
United States Rubber Co., New York.

Dress Shield Material.

Archer Rubber Co., Milford, Mass.
Hodgman Rubber Co., New York.
Plymouth Rubber Co., Canton, Mass.
United States Rubber Co., New York.
Vulcan Proofing Co., Brooklyn, N. Y.

Diving Apparatus.

Hale, Alfred, Rubber Co., Boston, Mass.
Hodgman Rubber Co., New York.
Schrader's, A. Son, Inc., Brooklyn.

Horse Covers.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.

(For Complete Addresses See Advertisements—Index Pages 95-97.)

THE AKRON ENGINEERING CO.

*Consulting and Designing Engineers
for Rubber Plants*

TIRES DIPPED GOODS MECHANICAL GOODS RECLAIMING

102 South Broadway, Akron, Ohio

TIRE FABRICS

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John H. Meyer & Co., Inc.

50 UNION SQUARE

NEW YORK

RUBBER IMPORTERS & DEALERS CO., Inc.
 H. W. HOLCOMBE, President
 SLOAN LAMONT, JR., Sec'y and Treas.
 200 Broadway, New York City
 Akron, Ohio Singapore
 Rubber Importers & Dealers Co., Inc. Rubber Importers, Limited
CRUDE RUBBER

**RUBBER TIRE
 MANUFACTURING PLANTS**

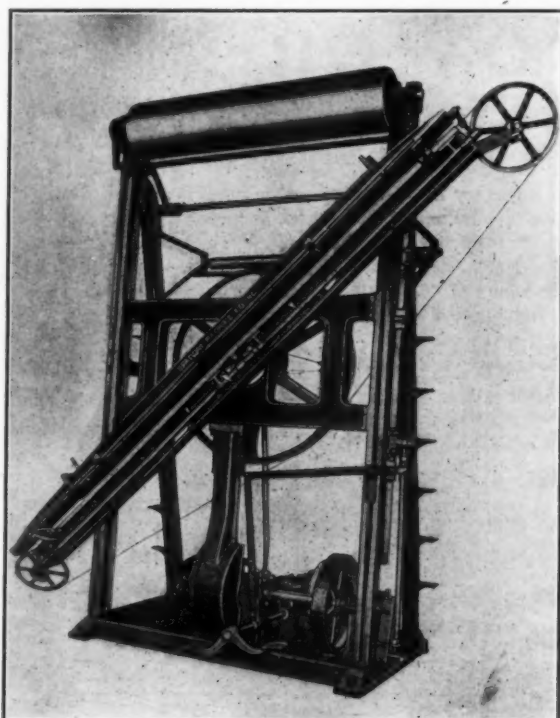
*Planned for Maximum Efficiency;
 Constructed Complete*

The Associated Engineers' Co.
ENGINEERS AND ARCHITECTS
 ENGINEERS BLDG., CLEVELAND, O.

**The
 Seamless Rubber Company**
 Incorporated
 New Haven, Conn.

Manufacturers of
 Medical Hospital Rubber Goods,
 Bathing Caps, Tennis Balls, Hand
 Balls, Striking Bags, Basket Ball
 and Football Bladders.

Prices and Samples Sent on Application



Front View at 45 Degrees.

Pat. No. 942164.

**The Bolton
 Vertical Bias Cutter**

If speed is wanted,
 If quickness in adjustment is wanted,
 If accuracy is wanted,
 If low cost of operation is wanted,
 If efficiency is wanted,
 If simplicity is wanted,
 If floor space is wanted,

Then Install This Remarkable Bias Cutter

Permanent Exhibit at International Machinery Exposition,
 Grand Central Palace, Sixth Floor, Section No. 39.

Spadone Machine Co.
 New York

FRANCIS SHAW & CO., Ltd., Manchester, England, Manufacturers
 and Selling Agents for Great Britain and British Colonies,
 Excepting Canada.

RUBBER BUYERS' DIRECTORY—Continued.

Horse Covers—Continued.

Goodrich, B. F., Co., The, Akron, Ohio.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.

Horse Cover Material.

Hodgman Rubber Co., New York.
Plymouth Rubber Co., Canton, Mass.
United States Rubber Co., New York.

Leggings.

Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.

Leather, Artificial.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Plymouth Rubber Co., Canton, Mass.

Leggings (Material).

Goodrich, B. F., Co., The, Akron, Ohio.
Hodgman Rubber Co., New York.
Plymouth Rubber Co., Canton, Mass.

Piano Player Cloths.

Vulcan Proofing Co., Brooklyn, N. Y.

Ponchos.

Archer Rubber Co., Milford, Mass.
Clifton Manufacturing Co., Boston, Mass.
Goodrich, B. F., Co., The, Akron, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

Printing on Rubber Surface.

Archer Rubber Co., Milford, Mass.
Plymouth Rubber Co., Canton, Mass.

Proofing.

Archer Rubber Co., Milford, Mass.
Archer-Strauss Rubber Co., Framingham, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Goodrich, B. F., Co., The, Akron, Ohio.
Hale, Alfred, Rubber Co., Atlantic, Mass.
Hodgman Rubber Co., New York.
Plymouth Rubber Co., Canton, Mass.
Toledo Auto Fabrics Co., The, Toledo, Ohio.

Rubber Coated Cloths.

Accurate Cover Co., New York.
Archer Rubber Co., Milford, Mass.
Archer-Strauss Rubber Co., Framingham, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Clifton Manufacturing Co., Boston, Mass.

du Pont, E. I., De Nemours & Co., New York.
Goldsmith, A. J., Co., New York.
Goodrich, B. F., Co., The, Akron, Ohio.
Hale, Alfred, Rubber Co., Atlantic, Mass.
Hodgman Rubber Co., New York.
Mechanical Fabric Co., Providence, R. I.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Plymouth Rubber Co., Canton, Mass.
Toledo Auto Fabrics Co., The, Toledo, Ohio.
United States Rubber Co., New York.

Spreading—Cord Fabric.

Vulcan Proofing Co., Brooklyn, N. Y.

RUBBER FOOTWEAR.**Boots and Shoes.**

Apsey Rubber Co., Hudson, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Firestone Tire & Rubber Co., Akron, O.
Goodrich, B. F., Co., The, Akron, Ohio.
Gutta Percha & Rubber, Limited, Toronto, Canada.
Hood Rubber Co., Boston, Mass.
Miner Rubber Co., Granby, Quebec.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.

Buckles.

Shoe Hardware Co., The, Waterbury, Conn.

Heels and Soles.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Diamond Rubber Co., The, Akron, Ohio.
Essex Rubber Co., Trenton, N. J.
Foster Rubber Co., Boston, Mass.
Gillette Rubber Co., New York.
Goodrich, B. F., Co., The, Akron, Ohio.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hale, Alfred, Rubber Co., Atlantic, Mass.
Hood Rubber Co., Watertown, Mass.
Miller Rubber Co., The, Akron, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Panther Rubber Manufacturing Co., Stoughton, Mass.
Plymouth Rubber Co., Canton, Mass.
United States Rubber Co., New York.
Western Rubber Works, Goshen, Ind.

Heel Nails, Rubber.

United Shoe Machinery Corp., Boston, Mass.

Shoe Findings and Specialties.

Clifton Manufacturing Co., Boston, Mass.
Essex Rubber Co., Trenton, N. J.
Foster Rubber Co., The, Boston, Mass.
Plymouth Rubber Co., Canton, Mass.
Shoe Hardware Co., Waterbury, Conn.
United States Knitting Co., Pawtucket, Mass.
United States Rubber Co., New York.

Soling.

Boston Belting Co., Boston, Mass.
Gutta Percha & Rubber, Ltd., Toronto, Can.
Panther Rubber Mfg. Co., Stoughton, Mass.
Plymouth Rubber Co., Canton, Mass.

Wading Pants.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Hale, Alfred, Rubber Co., Boston, Mass.

Wading Pants—Continued.

Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

DENTAL AND STAMP RUBBER.**Dental Gum.**

Goodrich, B. F., Co., The, Akron, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.

Dentists' Sundries.

Davidson Rubber Co., Boston, Mass.

Rubber Dam.

Davidson Rubber Co., Boston, Mass.
Daval Rubber Co., Providence, R. I.
Goodrich, B. F., Co., The, Akron, O.
Hodgman Rubber Co., New York.
Miller Rubber Co., Akron, O.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Sponge Rubber.

Faultless Rubber Co., Ashland, Ohio.
Miller Rubber Co., The, Akron, Ohio.
United States Rubber Co., New York.

Stamp Gum.

Goodrich, B. F., Co., The, Akron, O.
Gutta Percha & Rubber, Ltd., Toronto.
Male Rubber Co., Alfred, Boston, Mass.

ELECTRICAL.**Battery Jars.**

Brunswick-Balke-Clender Co., Chicago, Ill.

Electrical Supplies.

American Hard Rubber Co., New York.
Canfield Rubber Co., Bridgeport, Conn.
Electric Hose & Rubber Co., Wilmington, Del.
Hodgman Rubber Co., New York.
Stokes, Joseph, Rubber Co., Trenton, N. J.
Tyer Rubber Co., Andover, Mass.
Vulcanized Rubber Co., New York.



Catalog

Sent you for the asking. Gives you FACTS—and tells the Ford Tribloc story in an interesting way. Send for it.

POWER**AT TWO POINTS
SIMULTANEOUSLY**

The Planetary Drive insures double protection by providing double the normal traction area for each gear. Power, received from the hand wheel, is, by means of the small central pinion, delivered at two points simultaneously. Thus the breaking of two gears at the same time would be necessary before the load would fall.

The FORD TRIBLOC is manufactured for reliable service. It is in every sense a chain hoist of the highest quality. It operates with practically no care or attention, handling any class of load to capacity. And $3\frac{1}{2}$ to 1 is the factor of safety throughout.

FORD Chain Hoists are made in capacities from half a ton to twenty and more, in standard and special designs for every service.

FORD CHAIN BLOCK CO.
2ND & DIAMOND STREETS PHILADELPHIA, PA.

2174-D

OVER-SEAS REPRESENTATIVE

ALLIED MACHINERY COMPANY OF AMERICA
51 CHAMBERS ST. NEW YORK, U.S.A.

PARIS BRUSSELS TURIN BARCELONA RIO DE JANEIRO

COMPRESSED ASBESTOS HIGH-PRESSURE JOINTING.

Enquiries Solicited

**Large Stock kept of
Standard Sizes and
Qualities.**

**Made in Various
Colors and Marked
with Customer's
Trade Mark.**

WHOLESALE ONLY.

**Manufactured by
J. W. ROBERTS, Ltd.,
Armley, Leeds.
England.**

RUBBER BUYERS' DIRECTORY—Continued.

Hard Rubber Goods.

American Hard Rubber Co., New York.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Goodrich, B. F. Co., The, Akron, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Stokes, Joseph, Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Vulcanised Rubber Co., New York.

Insulating Compounds.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Katsenbach & Bullock Co., Inc., New York and Trenton, N. J.
Tyson Bros., Inc., Woodbridge, N. J.

Insulated Wire and Cables.

Goodrich, B. F. Co., The, Akron, Ohio.
Indiana Rubber and Insulated Wire Co., Jonesboro, Ind.
Kerite Ins. Wire & Cable Co., N. Y.
Pirelli & Co., Milan, Italy.
United States Rubber Co., New York.

Splicing Compounds.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canfield Rubber Co., Bridgeport, Conn.
Clifton Manufacturing Co., Boston, Mass.
Home Rubber Co., Trenton, N. J.
N. J. Car Spring & Rubber Co., Jersey City, N. J.
Plymouth Rubber Co., Canton, Mass.
United States Rubber Co., New York.

Tape—Rubber Insulating.

Clifton Manufacturing Co., Boston, Mass.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Plymouth Rubber Co., Canton, Mass.
United States Rubber Co., New York.

Tape—Cloth Friction.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Clifton Manufacturing Co., Boston, Mass.
Home Rubber Co., Trenton, N. J.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Plymouth Rubber Co., Canton, Mass.
United States Rubber Co., New York.

Wire—Rubber Insulated.

United States Rubber Co., New York.

Wire—Lead Covered.

United States Rubber Co., New York.

SPORTING GOODS.**Foot Balls.**

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Goodrich, B. F. Co., The, Akron, O.
Hodgman Rubber Co., New York.
United States Rubber Co., New York.

Golf Balls.

Goodrich, B. F. Co., The, Akron, O.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

Sporting Goods.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Essex Rubber Co., Trenton, N. J.
Goodrich, B. F. Co., The, Akron, O.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Pennsylvania Rubber Co., Jeannette, Pa.
Seamless Rubber Co., Inc., New Haven, Conn.
Tyler Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Striking Bags.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Goodrich, B. F. Co., The, Akron, O.
Hodgman Rubber Co., New York.
Rubber Products Co., Barberton, O.
United States Rubber Co., New York.

Tennis Balls.

Pennsylvania Rubber Co., Jeannette, Pa.
Seamless Rubber Co., Inc., New Haven, Conn.

RUBBER TIRES AND ACCESSORIES.**Accessories.**

Eckrode Rubber Co., Newark, N. J.
Essex Rubber Co., Trenton, N. J.
Firestone Tire & Rubber Co., Akron, O.
Flak Rubber Co., Chicopee Falls, Mass.
General Tire & Rubber Co., Akron, Ohio.
Miller Rubber Co., The, Akron, Ohio.

Auto Top Fabrics.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
du Pont, E. I., De Nemours & Co., New York.
Hodgman Rubber Co., New York.
Mutt, L. J., Co., Boston, Mass.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Plymouth Rubber Co., Canton, Mass.
Taylor, Armitage & Eagles, Inc., New York.
Toledo Auto Fabrics Co., The, Toledo, Ohio.
Turner Co., J. Spencer, New York.
United States Rubber Co., New York.
Vulcan Proofing Co., Brooklyn, N. Y.

Bead Braid (Wire).

National-Standard Co., Niles, Mich.

Inner Tubes.

Acme Rubber Mfg. Co., Trenton, N. J.
Brunswick-Balke-Collender Co., Chicago, Ill.
Eckrode Rubber Co., Newark, N. J.
Essex Rubber Co., Trenton, N. J.
General Tire & Rubber Co., Akron, Ohio.
Gillette Rubber Co., New York.
Goodrich, B. F. Co., The, Akron, O.
Gutta Percha & Rubber, Ltd., Toronto.
Hawkeye Tire & Rubber Co., Des Moines, Ia.
Hewitt Rubber Co., Buffalo, N. Y.
Hood Rubber Co., Watertown, Mass.
Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.
Inland Rubber Co., Chicago, Ill.
Kokomo Rubber Co., Kokomo, Ind.
Lincoln Highway Tire Co., Fulton, Ill.
McGraw Tire & Rubber Co., East Palestine, O.
Mason Tire & Rubber Co., Kent, Ohio.
Miller, Chas. E., Anderson, Ind.
Miller Rubber Co., The, Akron, Ohio.
N. J. Car Spring & Rubber Co., Jersey City, N. J.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Parker Tire & Rubber Co., Indianapolis, Ind.
Pennsylvania Tire & Rubber Co., Jeannette, Pa.
Perfection Tire & Rubber Co., Ft. Madison, Iowa.
Rubber Products Co., Barberton, O.
Tyler Rubber Co., Andover, Mass.
United States Rubber Co., New York.
United States Tire Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.

Mats—Automobile.

(See Matting and Mechanical Rubber Goods.)

(For Complete Addresses See Advertisements—Index Pages 95-97.)

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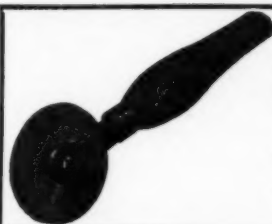
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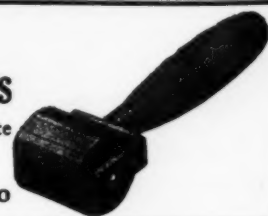
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Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Continental Rubber Works, Erie, Pa.
Essex Rubber Co., Trenton, N. J.
Fisk Rubber Co., New York.
General Tire & Rubber Co., Akron, Ohio.
Miller, Chas. E., Anderson, Ind.
Miller Rubber Co., Akron, Ohio.
N. J. Car Spring & Rubber Co., Jersey City, N. J.
Thermoid Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.

Rims, Wheel.

Goodrich, B. F., Co., The, Akron, Ohio.

Sectional Air Bags.

Miller, Chas. E., Anderson, Ind.
Miller Rubber Co., The, Akron, Ohio.

Tire Flaps.

Fisher Manufacturing Co., Lincoln, Nebr.

Tires (Airplanes).

Goodrich, B. F., Co., The, Akron, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Tire Co., New York.

Tires (Auto).

Acme Rubber Mfg. Co., Trenton, N. J.
Brunswick-Balke-Collender Co., Chicago, Ill.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Continental Rubber Works, Erie, Pa.
Firestone Tire & Rubber Co., Akron, Ohio.
Fisk Rubber Co., Chicopee Falls, Mass.
General Tire & Rubber Co., Akron, Ohio.
Gillette Rubber Co., New York.
Goodrich, B. F., Co., The, Akron, Ohio.
Gutta Percha & Rubber, Ltd., Toronto.
Hewitt Rubber Co., Buffalo, N. Y.
Hood Rubber Co., Watertown, Mass.
Indiana Rubber and Insulated Wire Co., Jonesboro, Ind.
Inland Rubber Co., Chicago, Ill.

Tires (Auto)—Continued.

Kokomo Rubber Co., Kokomo, Ind.
Lee Tire & Rubber Co., New York.
Lincoln Highway Tire Co., Fulton, Ill.
Mason Tire & Rubber Co., Kent, Ohio.
McGraw Tire & Rubber Co., East Palestine, O.
Miller, Chas. E., Anderson, Ind.
Miller Rubber Co., Akron, Ohio.
N. J. Car Spring & Rubber Co., Jersey City, N. J.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Parker Tire & Rubber Co., Indianapolis, Ind.
Pennsylvania Rubber Co., Jeannette, Pa.
Perfection Tire & Rubber Co., Ft. Madison, Iowa.
Pirelli & Co., Milan, Italy.
Portage Rubber Co., Barberton, Ohio.
Quaker City Rubber Co., Philadelphia, Pa.
Rubber Products Co., Barberton, O.
Thermoid Rubber Co., Trenton, N. J.
Tyer Rubber Co., Andover, Mass.
United States Tire Co., New York.

Tires—Baby Carriage.

North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.

Tires (Bicycle).

Continental Rubber Works, Erie, Pa.
Fisk Rubber Co., Chicopee Falls, Mass.
Goodrich, B. F., Co., The, Akron, O.
Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.
Kokomo Rubber Co., Kokomo, Ind.
Miller, Chas. E., Anderson, Ind.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Pennsylvania Rubber Co., Jeannette, Pa.
United States Tire Co., New York.

Tires (Crate).

Steele-Alderfer Co., Cuyaboga Falls, Ohio.

(For Complete Addresses See Advertisements—Index Pages 95-97.)

Tires (Motorcycle).

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Continental Rubber Works, Erie, Pa.
Firestone Tire & Rubber Co., Akron, O.
Fisk Rubber Co., Chicopee Falls, Mass.
Goodrich, B. F., Co., The, Akron, O.
Kokomo Rubber Co., Kokomo, Ind.
McGraw Tire & Rubber Co., East Palestine, O.
Miller, Chas. E., Anderson, Ind.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Pennsylvania Rubber Co., Jeannette, Pa.
United States Tire Co., New York.

Tires (Solid).

Continental Rubber Works, Erie, Pa.
Firestone Tire & Rubber Co., Akron, O.
Fisk Rubber Co., Chicopee Falls, Mass.
General Tire & Rubber Co., Akron, O.
Gillette Rubber Co., New York.
Goodrich, B. F., Co., The, Akron, O.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Hood Rubber Co., Watertown, Mass.
Kokomo Rubber Co., Kokomo, Ind.
McGraw Tire & Rubber Co., East Palestine, O.
Mason Tire & Rubber Co., Kent, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Tire Co., New York.

Tire Fabrics (See Cotton Goods in Raw Materials and Supplies).

Tire Repair Materials.

Essex Rubber Co., Trenton, N. J.
Fisk Rubber Co., Chicopee Falls, Mass.
Miller, Chas. E., Anderson, Ind.
Voorhees Rubber Mfg. Co., Jersey City, N. J.

Valves, Tire.

Schrader's, A., Sons, Inc., New York.
Wire Bead Braids (Flat).
National-Standard Co., Niles, Mich.

RUBBER MACHINERY.

Accumulators—Hydraulic.

Adamson Machine Co., The, Akron, O.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Thropp's John E., Sons Co., Trenton, N. J.
Vaughn Machinery Co., The, Cuyaboga Falls, Ohio.
Watson-Stillman Co., The, Aldens, N. J.
Williams F. & M. Co., Akron, Ohio.

Acid Tanks.

Birmingham Iron Foundry, Derby, Conn.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyaboga Falls, Ohio.

Air Compressors.

Miller, Chas. E., Anderson, Ind.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Williams F. & M. Co., Akron, Ohio.

Band Cutting Machines.

Adamson Machine Co., The, Akron, O.
Birmingham Iron Foundry, Derby, Conn.

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Taylor Instrument Cos., Rochester, N. Y.
Tagliabue, Chas. J., Mfg. Co., Brooklyn, N. Y.

Bead Presses.

Allen Machine Co., Erie, Pa.
Southwark Foundry & Machine Co., Philadelphia, Pa.

Bead Trimmers.

Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Belt Folding Machines.

Birmingham Iron Foundry, Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.

Belt Slitters.

Farrel F. & M. Co., Ansonia, Conn.

Belt Stretchers.

Birmingham Iron Foundry, Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Hoggeon & Pettis Mfg. Co., New Haven, Conn.

Bias Cutters.

Birmingham Iron Foundry, Derby, Conn.
Spadone Machine Co., New York.

Boilers.

Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William R., & Sons' Co., Trenton, N. J.

Boiler Feed Water Purification.
Seafie, Wm. R., & Sons Co., Oakmont, Pa.

Braiders.

New England Butt Co., Providence, R. I.

Brakes—Disc and Motor Driven
Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.

Brushing Machines and Brushes.

Curtis & Marble Mach. Co., Worcester, Mass.
Cleveland-Osborn Mfg. Co., Cleveland, Ohio.
Osborn Mfg. Co., The, Cleveland, Ohio.

Brushes, Rotary Wire.

Cleveland-Osborn Manufacturing Co., Cleveland, Ohio.
Osborn Mfg. Co., The, Cleveland, Ohio.

Buffing Brushes.

Cleveland Osborn Mfg. Co., Cleveland, Ohio.
Osborn Mfg. Co., The, Cleveland, Ohio.

Buffing Machines.

Excelsior Tool & Machine Co., East St. Louis, Mo.
Gillette Rubber Co., Eau Claire, Wis.

Burrs—Light Steel for Rubber Heels.

Sessions, J. H., & Son, Bristol, Conn.
Ward & Andre, Brockton, Mass.

Calenders.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Black Rock Mfg. Co., Bridgeport, Conn.
Bridge, David, & Co., Castleton, Manchester, Eng.
Farrel F. & M. Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.
Wellman-Seaver-Morgan Co., Akron, Ohio.

Calenders—Brake Lining.

Black Rock Mfg. Co., The, Bridgeport, Conn.

Calender Screw-Down—Motor Driven.

Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.

Casting Models.

College Point Rubber Mold & Engraving Co., College Point, L. I., N. Y.

Castings.

Adamson Machine Co., The, Akron, O.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Buffalo Foundry & Machine Co., Buffalo, N. Y.

Excelsior Tool & Machine Co., E. St. Louis, Ill.

Farrel F. & M. Co., Ansonia, Conn.
Piamondon, A., Mfg. Co., Chicago, Ill.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Wellman-Seaver-Morgan Co., Akron, Ohio.
Williams F. & M. Co., Akron, Ohio.

Cell Dryers

Butterworth, H. W., & Sons Co., Philadelphia, Pa.

Chains.

Agricultural.
Automobile Engine.
Bicycle (Twin Roller).
Block.
Drive.

Power Transmission.
Silent (Rocker-Joint).
Sprocket Wheel.

Link-Belt Company, Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.

Chemical Apparatus.

Devine, J. P., Co., Buffalo, N. Y.

Chemical Plants.

Buffalo Foundry & Machine Co., Buffalo, N. Y.

Devine, J. P., Co., Buffalo, N. Y.

Chucks (Lathe).

Hoggeon & Pettis Mfg. Co., New Haven, Conn.

Terkelsen & Wennberg, Boston, Mass.

Churns and Cement Making Machines.

Cleveland Mixer & Mfg. Co., Cleveland, Ohio.
Day Co., J. H., Cincinnati, Ohio.
East Iron & Machine Co., Lima, Ohio.
Miller, Chas. E., Anderson, Ind.

Cloth Dryers.

Birmingham Iron Foundry, Derby, Conn.
Butterworth, H. W., & Sons Co., Philadelphia, Pa.

Farrel F. & M. Co., Ansonia, Conn.
Textile-Finishing Machinery Co., Providence, R. I.

Cloth Stretching Machine.

Birch, Sydney, & Co., Inc., Mansfield, Mass.

Clutches—Friction.

Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.

Farrel F. & M. Co., Ansonia, Conn.

Fletcher Works, Philadelphia, Pa.
Link-Belt Company, Chicago, Ill.

Piamondon, A., Mfg. Co., Chicago, Ill.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Williams F. & M. Co., Akron, Ohio.

Compound and Tote Boxes.

Carll's, Chas. W., Sons, Trenton, N. J.
Ornamental Iron Work Co., Akron, Ohio.

Condensers.

Buffalo Fdy. & Mach. Co., Buffalo, N. Y.

Conduits—Underground Steam or Hot Water Pipes

Ric-wil Co., The, Cleveland, Ohio.

Controllers—Electrical.

Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Controllers—Temperature.

Tagliabue, C. J., Mfg. Co., Brooklyn, N. Y.

Taylor Instrument Cos., Rochester, N. Y.

Cooling Tables.

Ornamental Iron Work Co., Akron, Ohio.

Couplings.

Dixon Valve & Coupling Co., Philadelphia, Pa.

Couplings—Flexible and Rigid.

Smith & Serrell, Newark, N. J.

Coverings—Underground Steam or Hot Water Pipes

Ric-wil Co., The, Cleveland, Ohio.

Crackers.

Adamson Machine Co., The, Akron, Ohio.

Allen Machine Co., Erie, Pa.

Birmingham Iron Foundry, Derby, Conn.

Farrel F. & M. Co., Ansonia, Conn.

Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Cranes.

Link-Belt Company, Chicago, Ill.

Southwark Foundry & Machine Co., Philadelphia, Pa.

Cranes—Hydraulic.

Watson-Stillman Co., The, Aldene, N. J.

Cranes—Locomotive.

Link-Belt Company, Chicago, Ill.

Utility Manufacturing Co., Cudahy, Ohio.

Cutters—Crude Rubber.

Peerless Machine Co., Racine, Wis.

Cutters—Scrap.

Taylor, Stiles & Co., Riegelsville, N. J.

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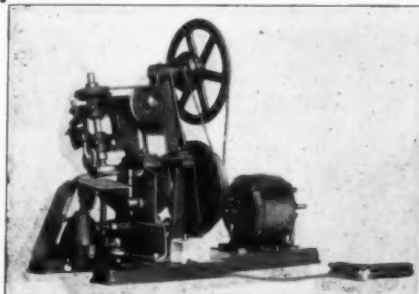
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(See Vulcanizers.)**Die Sinking and Engraving.**College Point Rubber Mold & Engraving Co., College Point, L. I., N. Y.
Ercolator Tool & Machine Co., East St. Louis, Mo.

Hoggson & Pettis Mfg. Co., New Haven, Conn.

Housatonic Mach. & Tool Co., Bridgeport, Conn.

Mechanical Mold & Machine Co., The, Akron, Ohio.

Ward & Andre, Brockton, Mass.

Williams F. & M. Co., Akron, Ohio.

Dipped Goods Forms (Porcelain).

Colonial Sign & Insulator Co., Akron, Ohio.

Dipping Machines and Racks.

Ornamental Iron Work Co., Akron, Ohio.

Doubling Machines.

Birmingham Iron Foundry, Derby, Conn.

Farrel F. & M. Co., Ansonia, Conn.

Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Drives—Mill

Birmingham Iron Foundry, Derby, Conn.

Fawcens Machine Co., Pittsburgh, Pa.

Drives—Silent Chain.

Link-Belt Company, Chicago, Ill.

Morse Chain Co., Ithaca, N. Y.

Dryers—Vacuum.

Buffalo Fdy. & Mach. Co., Buffalo, N. Y.

Devine, J. P. Co., Buffalo, N. Y.

Drying and Processing.

Carrier Engineering Corp., New York.

Hunter Dry Kiln Co., Indianapolis, Ind.

Drying Machines.

Allen Machine Co., Erie, Pa.

American Process Co., New York.

Birmingham Iron Foundry, Derby, Conn.

Bridge, David, & Co., Castleton, Manchester, Eng.

Buffalo Foundry & Machine Co., Buffalo, N. Y.

Carrier Engineering Corp., New York.

Devine, J. P. Co., Buffalo, N. Y.

Farrel F. & M. Co., Ansonia, Conn.

Hunter Dry Kiln Co., Indianapolis, Ind.

Textile-Finishing Machinery Co., Providence, R. I.

Dynamometer.

Hartford Special Machinery Co., Hartford, Conn.

Electric Heating Appliances for Industrial Purposes.

Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.

Electrical Safety Switches.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Elevators and Conveyors.

Link-Belt Company, Chicago, Ill.

Embossing Calendars.

Allen Machine Co., Erie, Pa.

Birmingham Iron Foundry, Derby, Conn.

Farrel F. & M. Co., Ansonia, Conn.

Textile-Finishing Machinery Co., Providence, R. I.

Engineering Devices.

Yarnall-Waring Co., Philadelphia, Pa.

Engines—Steam.

Southwark Foundry & Machine Co., Philadelphia, Pa.

Thropp's, John E., Sons Co., Trenton, N. J.

Thropp, William R., & Sons Co., Trenton, N. J.

Engraving Rolls.

Birmingham Iron Foundry, Derby, Conn.

Farrel F. & M. Co., Ansonia, Conn.

Hoggson & Pettis Mfg. Co., New Haven, Conn.

Engraving—Tire Molds.

Cladis Engineering Co., Lancaster, Ohio.

Die Sinking & Machine Co., The, Akron, Ohio.

Evaporators.

Devine, J. P. Co., Buffalo, N. Y.

Buffalo Foundry & Machine Co., Buffalo, New York.

Filters—Water.

Scife, Wm. B. & Sons Co., Oakmont, Pa.

Fittings.

Utility Manufacturing Co., Cudahy, Wis.

Fittings—Hydraulic Pipe.

Smith & Serrell, Newark, N. J.

Watson-Stillman Co., The, Aldene, N. J.

Gages.

Bristol Co., The, Waterbury, Conn.

Hoggson & Pettis Mfg. Co., New Haven, Conn.

Schaeffer & Budenberg Co., The, Brooklyn, N. Y.

Southwark Foundry & Machine Co., Philadelphia, Pa.

Tagliabue, C. J., Mfg. Co., Brooklyn, N. Y.

Taylor Instrument Cos., Rochester, N. Y.

Gages—Thickness.

Ames, B. C. Co., Waltham, Mass.

Hoggson & Pettis Mfg. Co., New Haven, Conn.

Randall, Frank E., Waltham, Mass.

Gears.

Spring.

Silent Chain.

Compensating.

Akron Gear & Engineering Co., Akron, Ohio.

Birmingham Iron Foundry, Derby, Conn.

Gears—Continued.

Fawcens Machine Co., Pittsburgh, Pa.

Link-Belt Company, Chicago, Ill.

Morse Chain Co., Ithaca, N. Y.

Piamondon Manufacturing Co., A., Chicago, Ill.

Gear Cutting.

Akron Gear & Engineering Co., The, Akron, Ohio.

Birmingham Iron Foundry, Derby, Conn.

Fawcens Machine Co., Pittsburgh, Pa.

Piamondon, A., Mfg. Co., Chicago, Ill.

Gears—Reduction.

Birmingham Iron Foundry, Derby, Conn.

Cleveland Worm Gear Co., Cleveland, O.

Fawcens Machine Co., Pittsburgh, Pa.

Wellman-Seaver-Morgan Co., Akron, O.

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Birmingham Iron Foundry, Derby, Conn.

Fawcens Machine Co., Pittsburgh, Pa.

Farrel F. & M. Co., Ansonia, Conn.

Heater Presses.

Adamson Machine Co., The, Akron, Ohio.

Allen Machine Co., Erie, Pa.

Hydraulic Press & Mfg. Co., The, Mt. Gilead, Ohio.

Southwark Foundry & Machine Co., Philadelphia, Pa.

Hoists.

Link-Belt Company, Chicago, Ill.

Utility Mfg. Co., Cudahy, Wis.

Hoists—Electric.

Ford Chain Block Co., Philadelphia, Pa.

Link-Belt Company, Chicago, Ill.

Hoists—Hydraulic.

Watson-Stillman Co., The, Aldene, N. J.

Hose Machines.

Birmingham Iron Foundry, Derby, Conn.

Farrel F. & M. Co., Ansonia, Conn.

New England Butt Co., Providence, R. I.

Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

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Pittsburgh Valve Foundry & Construction Co., Pittsburgh, Pa.
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Adamson Machine Co., The, Akron, O.
Allen Machine Co., Erie, Pa.
Housatonic Machine & Tool Co., Bridgeport, Conn.
New England Butt Co., Providence, R. I.
Royle, John, & Sons, Paterson, N. J.

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Hyde Mfg. Co., Southbridge, Mass.

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Schaeffer & Budenberg Co., The, Philadelphia, Pa.
Tagliabue, C. J., Mfg. Co., Brooklyn, N. Y.
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Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.
Farrel Foundry & Machine Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

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Adamson Machine Co., The, Akron, O.

Lathes—Jar Ring.

Adamson Machine Co., The, Akron, O.
Birmingham Iron Foundry, Derby, Conn.
Thropp's, John E., Sons Co., Trenton, N. J.

Lathes—Jar Ring—Continued.

Thropp, William R., & Sons' Co., Trenton, N. J.
Robertson, John, & Co., Brooklyn, N. Y.

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Link-Belt Company, Chicago, Ill.
Utility Manufacturing Co., Cudaby, Wis.

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Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.

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Morse Chain Co., Ithaca, N. Y.

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Hoggson & Pettis Mfg. Co., New Haven, Conn.

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Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.

Magnetic Separators.

Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.

Magnets—Lifting.

Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.

Mandrels—Tube Curing.

Republic Tool & Mfg. Co., Cleveland, Ohio.

Mandrels—Tube Splicing.

Carl's, Chas. W., Sons, Trenton, N. J.

Mandrels—Sherardize.

Mohegan Tube Co., Brooklyn, N. Y.
New Haven Sherardizing Co., New Haven, Conn.

Masticators.

East Iron & Machine Co., The, Lima, Ohio.

Measuring Rolls.

Curtis & Marble Mach. Co., Worcester, Mass.

(For Complete Addresses See Advertisements—Index Pages 95-97.)

Mill Room Cooling Tables.

Ornamental Iron Work Co., Akron, Ohio.

Mixers.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
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Thropp, William R., & Sons Co., Trenton, N. J.
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Wellman-Seaver-Morgan Co., Akron, Ohio.

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Adamson Machine Co., The, Akron, O.
Akron Equipment Co., The, Akron, Ohio.
Akron Gear & Engineering Co., Akron, Ohio.
Akron Rubber Mold and Machine Co., Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Brooklyn Tool Co., Brooklyn, Mass.
Cladlin Engineering Co., Lancaster, Ohio.
Cleveland Rubber Mold Foundry & Machine Co., The, Cleveland, Ohio.
Continental Rubber Works, Erie, Pa.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Housatonic Mach. & Tool Co., Bridgeport, Conn.
Kuhke Machine Co., Akron, Ohio.
Mahlow & Wyckoff, Trenton, N. J.
Mechanical Mold & Machine Co., The, Akron, Ohio.
Miller, Chas. E., Anderson, Ind.
Thropp's, John E., Sons Co., Trenton, N. J.
Ward & Andre, Brockton, Mass.
Williams Foundry & Machine Co., Akron, O.

Molds—Engraving.

Cladlin Engraving Co., Lancaster, O.

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Akron Gear & Engineering Co., Akron, Ohio.
College Point Rubber Mold & Engraving Co., College Point, L. I., N. Y.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Mechanical Mold & Machine Co., Akron, Ohio.
Ward & Andre, Brockton, Mass.

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College Point Rubber Mold & Engraving Co., College Point, L. I., N. Y.
Mechanical Mold & Machine Co., Akron, Ohio.

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Adamson Machine Co., Akron, Ohio.
Akron Gear & Engineering Co., The, Akron, Ohio.
Cleveland Rubber Mold & Machine Co., Cleveland, Ohio.
Mechanical Mold & Machine Co., Akron, Ohio.

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Akron Equipment Co., Akron, Ohio.
Akron Gear & Engineering Co., Akron, O.
Akron Rubber Mold & Machine Co., Akron, O.
Akron Standard Mold Co., Akron, Ohio.
Cladlin Engineering Co., Lancaster, Ohio.
Cleveland Rubber Mold Foundry & Machine Co., Cleveland, Ohio.
College Point Rubber Mold & Engraving Co., College Point, L. I., N. Y.
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Frans Foundry & Machine Co., Akron, Ohio.
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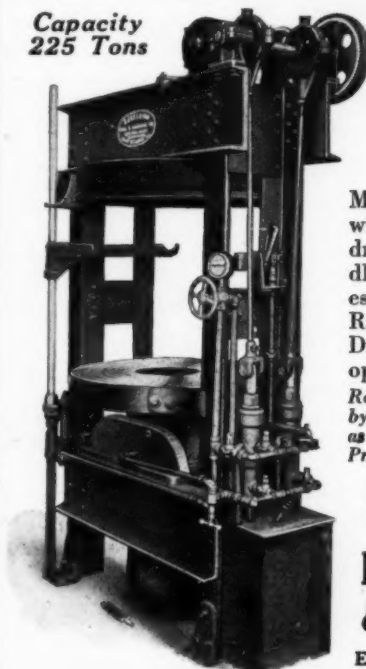
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Thropp's, John E., Sons Co., Trenton, N. J.
Wellman-Seaver-Morgan Co., Akron, Ohio.
Williams Foundry & Machine Co., Akron, Ohio.

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Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.

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Electric Motor & Repair Co., The, Akron, Ohio.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

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Adamson Machine Co., The, Akron, O.
Excelsior Tool & Machine Co., East St. Louis, Mo.

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Allen Machine Co., Erie, Pa.
Birmingham Iron Fdry., Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

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Birmingham Iron Foundry, Derby, Conn.
Bridge, David, & Co., Castleton, Eng.
Shaw, Francis, & Co., Ltd., Manchester, Eng.

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Bridge, David, & Co., Castleton, Eng.

Presses—Packing.

Black Rock Mfg. Co., The, Bridgeport, Conn.

Presses—Vulcanizing.

Adamson Machine Co., The, Akron, Ohio.
Akron Rubber Mold & Machine Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Farrel F. & M. Co., Ansonia, Conn.

Presses—Vulcanizing—Cont.

Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William H., & Sons' Co., Trenton, N. J.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.
Watson-Stillman Co., The, Aldene, N. J.
Wellman-Seaver-Morgan Co., Akron, Ohio.
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Buffalo Foundry & Machine Co., Buffalo, N. Y.
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Devine, J. P., Co., Buffalo, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.
Myers, F. E., & Bro., Ashland, O.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Watson-Stillman Co., The, Aldene, N. J.

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Southwark Foundry & Machine Co., Philadelphia, Pa.

Pumps—Vacuum.

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Devine, J. P., Co., Buffalo, N. Y.

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American Process Co., New York.
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Reclaiming Machinery—Cont.

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Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

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Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

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Rivets.

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Hoggson & Pettis Mfg. Co., New Haven, Conn.
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Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

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Wellman Co., Medford, Mass.

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Allen Machine Co., Erie, Pa.

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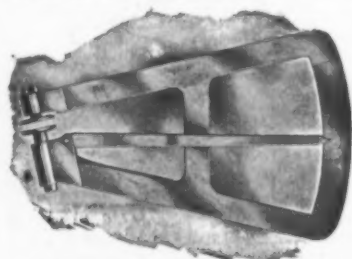
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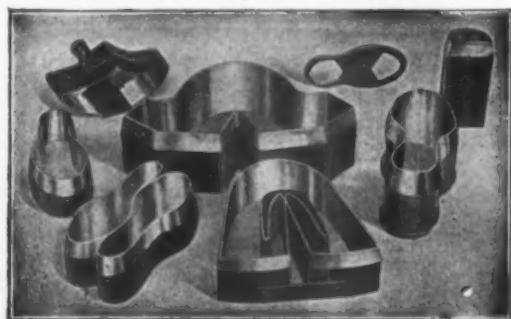
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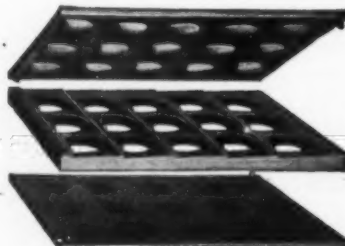
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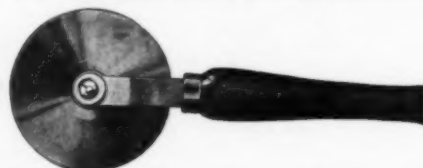


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Kuhle Machine Co., Akron, Ohio.
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Myers, F. E., & Bro., Ashland, Ohio.

Spreaders.

Adamson Machine Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Black Rock Mfg. Co., Bridgeport, Conn.
New England Butt Co., Providence, R. I.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

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Spring Silent Chain, Compensating, Link-Belt Company, Chicago, Ill.
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Sessions, J. H., & Son, Bristol, Conn.

Steel Stamps.

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Wellman Co., Medford, Mass.

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Akron Rubber Mold & Machine Co., Akron, Ohio.
Hoggson & Pettis Mfg. Co., New Haven, Conn.

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Ornamental Iron Work Co., Akron, O.

Stock Shells.

Carl's, Chas. W., Sons, Trenton, N. J.
Gammeter, W. F. Co., The, Cadiz, Ohio.
Ornamental Iron Works Co., Akron, Ohio.

Strip Cutters.

Cameron Machine Co., Brooklyn, N. Y.
New England Butt Co., Providence, R. I.
Spadone Machine Co., New York.

Stripping Tables.

Akron Standard Mold Co., Akron, Ohio.

Swing Joints.

Adamson Machine Co., The, Akron, Ohio.
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Biggs Boiler Works Co., Akron, Ohio.
Heifner, J. C., Mfg. Co., Ashland, Ohio.

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Hartford Special Machinery Co., Hartford, Conn.
Scott, Henry L., & Co., Providence, R. I.

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Schaefer & Budenberg Co., The, Brooklyn, New York.
Tagliabue, Chas. J., Mfg. Co., Brooklyn, N. Y.
Taylor Instrument Cos., Rochester, N. Y.

Tire Building Equipment.

Adamson Machine Co., The, Akron, Ohio.
Akron Rubber Mold & Machine Co., Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Fdy., Derby, Conn.
Carl's, Chas. W., Sons, Trenton, N. J.
Knight Mfg. Co., Canton, Ohio.
Pechstein Iron Works, Keokuk, Iowa.
Thropp's, John E., Sons Co., The, Trenton, N. J.
Williams Fdy. & Mach. Co., Akron, O.

Tire Building Machines.

Carl's, Chas. W., Sons, Trenton, N. J.
Knight Mfg. Co., Canton, Ohio.
Mathern, A., Zollikon-Zurich, Switzerland.
Thropp's, John E., Sons Co., The, Trenton, N. J.

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Gillette Rubber Co., East Claire, Wis.
Pechstein Iron Works, Keokuk, Iowa.

Tire Fabric Puller.

Hibbs Rubber Co., Inc., The, Fort Worth, Texas.
Reichel & Drews, Chicago, Ill.

Tire Lasts.

Miller, Chas. E., Anderson, Ind.

Tire Machine Drums.

Gammeter, W. F. Co., The, Cadiz, Ohio.

Tire Mold Engraving Machine.

Gorton, George, Machine Co., Racine, Wis.

Tire Presses.

Adamson Machine Co., The, Akron, Ohio.
Akron Equipment Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Excelsior Tool & Machine Co., East St. Louis, Mo.
Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.
Miller, Chas. E., Anderson, Ind.
Southward Foundry & Machine Co., Philadelphia, Pa.
Terkelsen & Wennberg, Boston, Mass.
Watson-Stillman Co., The, Aldene, N. J.
Wellman-Seaver-Morgan Co., Akron, Ohio.

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Akron Rubber Mold & Mach. Co., The, Akron, O.
Biggs Boiler Works Co., The, Akron, O.
Frans Foundry & Machine Co., Akron, Ohio.
Hibbs Rubber Co., Inc., The, Fort Worth, Texas.
Miller, Chas. E., Anderson, Ind.
Western Tire & Rubber Works, Chicago, Ill.
Williams, F. & M. Co., Akron, Ohio.

Tire Vulcanizing Presses.

The Adamson Machine Co., Akron, O.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Hydraulic Press Mfg. Co., The, Mt. Gilead, Ohio.
Southward Foundry & Machine Co., Philadelphia, Pa.
Williams, F. & M. Co., Akron, Ohio.

Tire Wrapping Machine

Adamson Machine Co., The, Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Black Rock Mfg. Co., The, Bridgeport, Conn.
Miller, Chas. E., Anderson, Ind.
Pierce Wrapping Mach. Co., Chicago, Ill.
Rossmann, Roy G., Seattle, Washington.
Terkelsen & Wennberg, Boston, Mass.
Thropp's, John E., Sons Co., Trenton, N. J.

Transmission (Silent) Chains.

Link-Belt Company, Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.

Trimmers.

Morris, T. W., Chicago, Ill.
Wills, Arthur Jackson, North Brookfield, Mass.

Tube Wrapping Machines.

Akron Rubber Mold & Machine Co., Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Black Rock Mfg. Co., The, Bridgeport, Conn.

Tubing Machines.

Adamson Machine Co., Akron, O.
Akron Rubber Mold & Machine Co., Akron, O.
Allen Machine Co., Erie, Pa.
Black Rock Mfg. Co., The, Bridgeport, Conn.
Housatonic Mach. & Tool Co., Bridgeport, Conn.
Royle, John, & Sons, Paterson, N. J.
Wellman-Seaver-Morgan Co., Akron, Ohio.
Williams Foundry & Machine Co., Akron, Ohio.

Turbines—Steam.

Southward Foundry & Machine Co., Philadelphia, Pa.

Vacuum Cloth Impregnating Equipment.

Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.
Shaw, Francis, & Co., Ltd., Manchester, England.

Valve Grinders.

Logemann Bros. Co., Milwaukee, Wis.
Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, Pa.
Quaker City Rubber Co., Philadelphia, Pa.

Valves.

Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, Pa.
Southward Foundry & Machine Co., Philadelphia, Pa.
Utility Manufacturing Co., Cudahy, Wis.
Yarnall-Waring Co., Philadelphia, Pa.

Valves (Reducing).

Mason Regulator Co., Dorchester, Mass.
Varnishing Machines.

Vulcanizers.

Adamson Machine Co., Akron, O.
Akron Equipment Co., The, Akron, Ohio.
Akron Rubber Mold & Machine Co., Akron, O.
Allen Machine Co., Erie, Pa.
Biggs Boiler Works Co., Akron, O.
Birmingham Iron Foundry, Derby, Conn.
Devine, J. P., Co., Buffalo, N. Y.

Vulcanizers—Continued.

Farrel F. & M. Co., Ansonia, Conn.
Fisk Rubber Co., Chicopee Falls, Mass.
Miller, Chas. E., Anderson, Ind.
Southward Fdy. & Mach. Co., Phila., Pa.
Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William R., & Sons' Co., Trenton, N. J.
Williams F. & M. Co., Akron, Ohio.

Washers.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Bridge, David, & Co., Castleton, Manchester, Eng.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Shaw, Francis, & Co., Ltd., Manchester, England.
Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William R., & Sons Co., Trenton, N. J.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Washers—Light Steel for Rubber Heels.

Sessions, J. H., & Son, Bristol, Conn.
Water Softening and Purifying Apparatus.

Sealife, Wm. B., & Sons Co., Oakmont, Pa.

Wheels—Wire Buffing.

Cleveland Osborn Mfg. Co., Cleveland, Ohio.

Wrapping Machines.

Adamson Machine Co., Akron, O.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Miller, Chas. E., Anderson, Ind.
Pierce Wrapping Machine Co., Chicago, Ill.
Rossmann, Roy G., Seattle, Wash.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

SECOND-HAND MACHINERY

Electric Motor & Repair Co., The, Akron, Ohio.
Liebstein, T. B., Newark, N. J.
McGrory, Philip, Trenton, N. J.
Norton, M., & Co., Charlestown, Mass.

RAW MATERIALS AND SUPPLIES

Accelerators (Organic).

Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
du Pont, E. I., De Nemours & Co., New York.
Frazar & Co., New York.
General Metallic Oxides Co., New York.
Hoolley Hill Rubber & Chemical Co., Hoolley Hill, Eng.
Katzbach & Bullock Co., New York.
Klipstein, A., & Co., New York.
Laidlaw, Kelley & Co., Inc., New York.

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ELATERON

PERFECT MINERAL RUBBER.

THE BEST HYDRO-CARBON which contributes to A BETTER COMPOUND

MADE IN CLEVELAND and used by RUBBER MANUFACTURERS EVERYWHERE

CANFIELD OIL CO. Cleveland, O.

WATSON—STILLMAN HYDRAULIC PRESSES



Two Cylinder Hydraulic Heating Press.

Equipped with steam or gas heated plates for pressing and forming rubber, gutta percha and composition goods in moulds.

This is a large platen, low pressure heating and chilling press, designed to turn out large quantities of work where low pressures only are required.

The top and bottom platens and both plates are made of cast iron and the cylinder of steel. The plates are guided along the rods by babbitt metal bearings.

We are prepared to furnish complete hydraulic press equipment—accumulators, pumps, intensifiers, valves, fittings, etc.

Write for catalogs.

The Watson-Stillman Co., 32 Dey Street
NEW YORK

Engineers and Builders of Hydraulic Machinery

CHICAGO—McCormick Building

PHILADELPHIA—Widener Building

GASOLINE STORAGE AND PRESSURE TANKS

of every description

Standard sizes in stock

Prompt shipment

Write for Price List

The Biggs Boiler Works Co.

Tank Department

AKRON, OHIO



WEAR Wearflex Gloves

Made of Rubber, Rock
and Fabric for rough,
hard work.

Manufactured by

**The McAdoo-Akron
Company**
Akron, Ohio

SCHAEFFER & BUDENBERG
NEW YORK

Gauges, Thermometers
Recorders, Etc.

For the measurement of
pressure, vacuum temper-
ature.

*A complete line for every
need in the Rubber In-
dustry.*

**SCHAEFFER &
BUDENBERG**
Makers of Efficiency Promoting
Instruments

Brooklyn N. Y.
Chicago Los Angeles
Pittsburgh San Francisco
Philadelphia St. Louis

1850
EXPERIENCE
SERVICE
QUALITY
CAPABILITY

MACHINERY AND SUPPLIES FOR RUBBER MILLS—Continued

Accelerators (Organic) — Cont.

National Aniline & Chemical Co., New York.
National Sales & Trading Co., Cleveland, Ohio.
Naugatuck Chemical Co., Naugatuck, Conn.
Rubber Chemical Co., Ltd., London, England.
Smith, Alfred, Ltd., New York.
Tyler Patterson Co., Cleveland, Ohio.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Acids.

Daigger, A., & Co., Chicago, Ill.
du Pont, E. I., De Nemours & Co., New York.
Holly-Wood Chemical Co., New York.
Katsenbach & Bullock Co., New York.
National Aniline & Chemical Co., New York.
Naugatuck Chemical Co., Naugatuck, Conn.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Acids—Sulphuric.

New Jersey Zinc Co., New York.
Scheel, William H., New York.

Alba Whiting.

Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Industrial Chemical Co., New York.
Katsenbach & Bullock Co., New York.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Aluminum Flake.

Aluminum Flake Co., The, Akron, O.
Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
Katsenbach & Bullock Co., New York.
Laidlaw, Kelley & Co., Inc., New York.
National Sales & Trading Co., Cleveland, Ohio.
Scheel, William H., New York.

Aniline Oil.

Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fuhrer, Edward B., Trenton, N. J.
Holly-Wood Chemical Co., New York.
Innis, Speiden & Co., Inc., New York City.
Katsenbach & Bullock Co., New York.
Klipstein, A., & Co., New York City.
Laidlaw, Kelley & Co., Inc., New York.
National Aniline & Chemical Co., New York.
National Sales & Trading Co., Cleveland, Ohio.
Naugatuck Chemical Co., Naugatuck, Conn.
Scheel, William H., New York.
Tyler Patterson Co., Cleveland, Ohio.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Antimony, Sulphurets of. Golden and Crimson.

Atlas Chemical Co., Waltham, Mass.
Butcher, L. H., Co., New York.
Cooper, Charles, & Co., New York.
Daigger, A., & Co., Chicago, Ill.
Foote Mineral Co., Inc., Philadelphia, Pa.
Fraser & Co., New York.
Fuhrer, Edward B., Trenton, N. J.
General Metallic Oxides Co., New York.
Grund & Krause, Cleveland, Ohio.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Innis, Speiden & Co., Inc., New York City.
Katsenbach & Bullock Co., New York.
Klipstein, A., & Co., New York.
Laidlaw, Kelley & Co., Inc., New York.
National Sales & Trading Co., Cleveland, Ohio.
Naugatuck Chemical Co., Naugatuck, Conn.
Rare Metal Products Co., Belleville, N. J.
Reichard-Coulston, Inc., New York.
Rubber Chemical Co., Ltd., London, England.
Scheel, William H., New York.

Antimony, Sulphurets of — Continued.

Smith, Alfred, Ltd., New York.
Smith Chemical & Color Co., New York.
Tyler Patterson Co., Cleveland, Ohio.
Type & King, Ltd., Mitcham, England.
Tyson Bros., Inc., Woodbridge, N. J.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Artificial Rubber.

Ashley, T. C., Boston, Mass.
Carter Bell Mfg. Co., New York.
Scheel, William H., New York.
Stamford (Conn.) Rubber Supply Co., Stamford, Conn.
T. H. & B. Chem. Co., Hyde Park, Mass.
Tyne & King, London, England.
Tyson Bros., Inc., Woodbridge, N. J.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Asbestine.

Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fuhrer, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Innis, Speiden & Co., Inc., New York City.
Katsenbach & Bullock Co., New York.
National Sales & Trading Co., Cleveland, Ohio.
Scheel, William H., New York.
Smith Chemical & Color Co., New York.
Williams, G. K., & Co., Easton, Pa.

Balata.

Aschott & Co., H. A., New York.
Chipman, B. L., New York.
Dunbar, J. Frank, Co., Inc., Boston, Mass.
Jacoby, Ernest, Boston, Mass.
Kuh, E. S., & Valk Co., New York.
Pell & Dumont, New York.
Raw Products Co., N. Y.
Wood, Charles B., New York.

Barium Dust.

Vanderbilt, R. T., Co., New York.

Barium Sulphate Precipitated.

Smith Chemical & Color Co., New York.
Cooper, Charles, & Co., New York.

Barytes.

Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fuhrer, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Innis, Speiden & Co., Inc., New York City.
Katsenbach & Bullock Co., New York.
Laidlaw, Kelley & Co., Inc., New York.
National Sales & Trading Co., Cleveland, Ohio.
Reichard-Coulston, Inc., New York.
Scheel, William H., New York, N. Y.
Smith Chemical & Color Co., New York.
Tyler Patterson Co., Cleveland, Ohio.
Tyson Bros., Inc., Woodbridge, N. J.
Vanderbilt, R. T., Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Basofo.

Waldo, E. M., & F., New York.

Benzol.

Cabot, Samuel, Boston, Mass.
Cooper, Charles, & Co., New York.
Daigger, A., & Co., Chicago, Ill.
du Pont, E. I., De Nemours & Co., New York.
Grund & Krause, Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Katsenbach & Bullock Co., New York.
Klipstein, A., & Co., New York City.
Scheel, William H., New York.
Tyler Patterson Co., Cleveland, Ohio.
Tyson Bros., Inc., Carteret, N. J.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

(For Complete Addresses See Advertisements—Index Pages 95-97.)

MOLDS CORES

RUBBER MILL EQUIPMENT

Our new modern plant is completely equipped with the latest improved machinery for producing all types of molds and cores for cord or fabric tires.

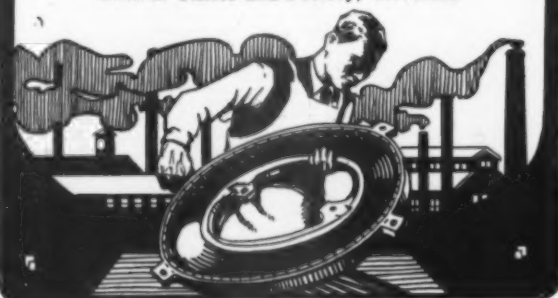
MOLD and CORE orders accepted for all sizes up to eight inches.

FABRIC
CORD
METRIC

SOLID
NON-SKID
RIBBED TREAD

Full particulars concerning prices and deliveries given upon receipt of your specifications.

The Cleveland Rubber Mold Foundry & Machine Co.
General Offices and Factory, Cleveland



LEE

**Cord
Fabric
Puncture-Proof**



Lee puncture-proof patents make it possible for us to offer the only complete line of pneumatic tires for every pleasure and business purpose.



LEE TIRE & RUBBER CO.
Executive Offices — 245 West 55th Street
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FACTORIES CONROHOCKEN PA.



This Tycos Is Helping to More Uniform Products

The extreme sensitiveness of the TYCOS Vapor Tension Type Recording Thermometer is its chief recommendation to the rubber industry.

Reliable records of different heats so necessary for checking purposes in keeping products uniform, are assured when these instruments are installed.

There are TYCOS instruments for every temperature application in the rubber industry. These instruments are designed and applied with the solution of your special problem in mind. This is the reason for their uniform success—why a request for further information concerning TYCOS instruments may prove profitable.

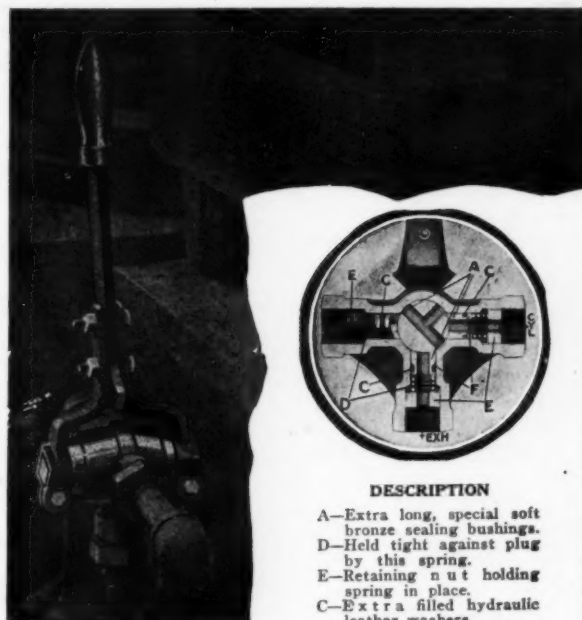


Taylor Instrument Companies

Rochester, N. Y.

There's a Tygos or Taylor Thermometer for Every Purpose

T-4



DESCRIPTION

- A—Extra long, special soft bronze sealing bushings.
- D—Held tight against plug by this spring.
- E—Retaining nut holding spring in place.
- C—Extra filled hydraulic leather washers.
- F—Vents for admitting pressure behind C.
- Rotary part of valve self-grinding on A.

There should be one on each of your presses

The proper operation of your hydraulic presses depends so much upon the efficiency of the valves that great care should be taken to make certain only thoroughly reliable valves are chosen.

You can be sure of this when you select

YARWAY Hydraulic Valves

(CASKEY PATENTS)

They operate easily, instantly and accurately. Fluid pressure is always under perfect control. Presses are made more sensitive—more efficient.

Results are improved in many ways.

In the Yarway Hydraulic Valve (Caskey Patents), the bushings and plug are always in contact under pressure, and remain tight automatically—in fact, the greater the pressure, the tighter the valve holds.

These and many other good points are explained in bulletin. Write for copy today.

Yarnall-Waring Company

7602-20 Queen Street

Chestnut Hill

Philadelphia

Representatives in all principal cities.

RAW MATERIALS AND SUPPLIES FOR RUBBER MILLS — Continued

Black Hypo.

Daligger, A., & Co., Chicago, Ill.
Katsenbach & Bullock Co., New York.
Reichard-Coulston, Inc., New York.
Scheel, William H., New York.
Typle & King, London, England.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Blanc Fixe.

Butcher, L. H., Co., New York.
Daligger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Innis, Spelden & Co., Inc., New York City.
Katsenbach & Bullock Co., New York.
Klipstein, A., & Co., New York.
National Sales & Trading Co., Cleveland, Ohio.
Reichard-Coulston, Inc., New York.
Tyler Patterson Co., Cleveland, Ohio.
Vanderbilt, R. T., Co., New York.
Waldo, E. M. & F., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Bolted Lime.

Daligger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Katsenbach & Bullock Co., New York.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Cadmium Yellow.

Butcher, L. H., Co., New York.
Daligger, A., & Co., Chicago, Ill.
Grund & Krause, Cleveland, Ohio.
Harshaw, Fuller & Goodwin Co., The Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Innis, Spelden & Co., Inc., New York City.
Katsenbach & Bullock Co., New York.
Waldo, E. M. & F., New York.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Carbon Bisulphide and Tetrachloride.

Butcher, L. H., Co., New York.
Cooper, Charles, & Co., New York.
Daligger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Innis, Spelden & Co., Inc., New York City.
Katsenbach & Bullock Co., New York.
Klipstein, A., & Co., New York City.
Laidlaw, Kelley & Co., Inc., New York.
National Aniline & Chemical Co., New York.
National Sales & Trading Co., Cleveland, Ohio.
Smith Chemical & Color Co., New York.
Tyler Patterson Co., Cleveland, Ohio.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Carbon Black.

Binney & Smith Co., New York.
Butcher, L. H., Co., New York.
Cabot, Godfrey L., Boston, Mass.
Daligger, A., & Co., Chicago, Ill.
Grund & Krause, Cleveland, Ohio.
Harshaw, Fuller & Goodwin Co., The Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Industrial Chemical Co., New York.
Innis, Spelden & Co., Inc., New York City.
Katsenbach & Bullock Co., New York.
Laidlaw, Kelley & Co., Inc., New York.
National Sales & Trading Co., Cleveland, Ohio.
Reichard-Coulston, Inc., New York.
Smith Chemical & Color Co., New York.
Scheel, William H., New York.
Seaver & Co., Boston, Mass.
Tyler Patterson Co., Cleveland, Ohio.
West Co., W. T., Boston, Mass.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Caustic Soda.

Butcher, L. H., Co., New York.
Cooper, Charles, & Co., New York.

Caustic Soda—Continued.

Daligger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Grund & Krause, Cleveland, Ohio.
Harshaw, Fuller & Goodwin Co., The Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Innis, Spelden & Co., Inc., New York City.
Katsenbach & Bullock Co., New York.
Scheel, William H., New York.
Tyler Patterson Co., Cleveland, Ohio.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Cement (Rubber).

Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Emex Rubber Co., Trenton, N. J.
Goodrich, B. F. Co., The Akron, O.
Hale, Alfred, Rubber Co., Boston, Mass.
Hodgman Rubber Co., New York.
Miller Rubber Co., Akron, O.
Montgomery Bros., Inc., Philadelphia, Pa.
New Jersey Car Spring & Rubber Co., Jersey City, N. J.
New York Belting & Packing Co., N. Y.

Cement Cans.

Heffner, J. C., Co., Akron, Ohio.
McNutt, William H., New York.
United Shoe Machinery Corp., Boston, Mass.

Chemicals and Ingredients.

Ashley, T. C., Boston, Mass.
Brown, W. G., & Co., Cincinnati, Ohio.
Binney & Smith Co., New York.
Butcher, L. H., Co., New York.
Cooper, Charles, & Co., New York.
Daligger, A., & Co., Chicago, Ill.
de Pont, B. L., de Nemours & Co., New York City.
General Metallic Oxides Co., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Innis, Spelden & Co., Inc., New York City.

Chemicals and Ingredients—Cont.

Katsenbach & Bullock Co., New York.
Klipstein, A., & Co., New York City.
National Aniline & Chemical Co., New York.
National Sales & Trading Co., Cleveland, Ohio.
Pardee, A. L., Akron, Ohio.
Robertson Paint & Varnish Co., Cleveland, Ohio.
Rubber Chemical Co., Ltd., London, England.
Smith, Alfred, Ltd., New York.
Smith Chemical & Color Co., New York.
Smith, J. Lee, & Co., New York.
Stresen-Reuter & Hancock, Inc., Chicago, Ill.
T. H. & B. Chemical Co., Hyde Park, Mass.
Tyler Patterson Co., Cleveland, Ohio.
Tyson Bros., Inc., Woodbridge, N. J.
Waldo, E. M. & F., New York.
Westmoreland Chemical & Color Co., Philadelphia, Pa.
Wilkes Martin Wilkes Co., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

China Clay.


Butcher, L. H., Co., New York.
Daligger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Innis, Spelden & Co., Inc., New York City.
Katsenbach & Bullock Co., New York.
Laidlaw, Kelley & Co., Inc., New York.
Scheel, William H., New York.
Taintor Mfg. Co., H. F., New York.
Vanderbilt, R. T., Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Williams & Co., C. K., Easton, Pa.
Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Colors.

Binney & Smith Co., New York.
Butcher, L. H., Co., New York.
Cooper, Charles, & Co., New York.

(For Complete Addresses See Advertisements—Index Page 95, 97.)

RUBBER MAKERS
CHEMICALS

ACIDS ALUMINUM SILICATE ANILINE OIL ANTIMONY BARYTES BENZOL BLACKS BLUES CARBON BISULPHIDE CAUSTIC SODA CHINA CLAY GLYCERINE GREENS HYDROCARBON LIME FLOUR	EXCELLEREX The Vulcanizing Speeder  PALMOLINE (Palm Oil Substitute)	LITHARGE LITHOPONE MAGNESIA PETROLATUM RED OXIDE ROBIN SILICA SOAPSTONE SODA ASH SULPHUR SULPHUR CHLORIDE TURPENTINE VERMILION ZINC OXIDE YELLOW
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Katsenbach & Bullock Co.

440 Washington Street NEW YORK, N. Y.

BRANCHES

Boston Trenton Philadelphia Montreal Akron Chicago
San Francisco Paris Buenos Ayres

**HYDE
MFG. CO.****MFG. OF ALL KINDS
OF KNIVES**

For Factory Use

Write for Our Catalogue on Rubber Knives



Southbridge

Massachusetts

New York Office

41 UNION SQUARE, NEW YORK CITY

"To Save Is to Profit"



This is our slogan and part of our trade mark.

Let us help you to carry it out in your plant.

Solvent recovery is today a most attractive field for producing real savings.

Due to the extreme simplicity of our system both the first cost and the maintenance are surprisingly low.

No auxiliary apparatus such as fans, pumps or compressors are used.

The safety of the apparatus is certain. During six years of operation in over 30 large factories in Europe not a single explosion or fire has occurred in any of our machines.

May we discuss this subject with you.

BENZINE CONDENSATION CO., Inc., 224 W. 42d St., N. Y.

Donolith

THE HIGHEST GRADE LITHOPONE

The unequalled fineness
and uniformity of
PONOLITH place
it in a class by itself.

The Krebs Pigment & Chemical Co.

Works
Newport - Delaware
Sales Office

217 Broadway

New York City



Safety Bench Can for Gasolene

The New York City Fire Department has issued an approval for using McNutt Bench Cans.

THE FACTORY MUTUALS INSPECTION BUREAU APPROVE AND RECOMMEND THE McNUTT BENCH CANS

If you do not find them to be a money saver and absolutely safe as far as fire and explosion are concerned, you may return them at our expense. Thousands of these cans now in daily use. They soon pay for their initial cost. They not only save money, but protect life and property, also reduce insurance cost.

Capacity—1 Pint, 1 Quart, 3 Pints. Larger Sizes Special

For further particulars address

W. H. McNUTT, 83 CHAMBERS ST., N. Y.

RAW MATERIALS AND SUPPLIES FOR RUBBER MILLS — Continued

Colors—Continued.	Cotton Goods—Continued.	Cotton Goods—Continued.	Exhaust Heads.
Daigger, A., & Co., Chicago, Ill. du Pont, E. I., de Nemours & Co., New York. Grund & Krause, Cleveland, Ohio. Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio. Holly-Wood Chemical Co., New York. Innis, Spelden & Co., Inc., New York City. Katsenbach & Bullock Co., New York. Klipstein, A., & Co., New York City. Kohnstamm, H., & Co., New York. Laidlaw, Kelley & Co., Inc., New York. National Aniline & Chemical Co., New York. National Sales & Trading Co., Cleveland, Ohio. Reichard-Coulston, Inc., New York. Rubber Chemical Co., Ltd., London, England. Scheel, William H., New York. Smith Chemical & Color Co., New York. Smith, J. Lee, & Co., New York. Tyne & King, London, England. Tyson Bros., Inc., Woodbridge, N. J. Waldo, E. M. & F., New York. Westmoreland Chem. & Color Co., Philadelphia, Pa. Whittaker, Clark & Daniels, Inc., New York. Wilkes Martin Wilkes Co., New York. Williams, C. K., & Co., Easton, Pa. Wishnick-Tumpeur Chemical Co., Chicago, Ill.	Hollands. Kavanaugh, Geo. W., New York. Osasburgs. Curran & Barry, New York. Kavanaugh, Geo. W., New York. Mt. Vernon-Woodbury Mills Co., Baltimore, Md. Turner, Halsey Co., New York. Wellington, Sears & Co., Boston, Mass. Sheetings. Brander & Curry, Inc., New York. Kavanaugh, Geo. W., New York. Wellington, Sears & Co., Boston, Mass. Stockinettes. United States Knitting Co., Pawtucket, R. I. Tire Fabrics. Bibb Mfg. Co., Macon, Ga. Brander & Curry, Inc., New York. Brighton Mills, Passaic, N. J. Burr, Albert E., & Co., New York. Caldwell, R. J., Co., Inc., New York. Cabarrus Cotton Mills, Kannapolis, N. C. Goldsmith, A. J., Co., New York. Hewins, E. D., Inc., Boston, Mass. Jencks Spinning Co., Pawtucket, R. I. Kavanaugh, Geo. W., New York. Lane, J. H., & Co., New York. Manhasset Mfg. Co., Providence, R. I. Meyer, John H., & Co., New York. Pardee, A. L., Akron, Ohio. Salmon Falls Mfg. Co., Boston, Mass. Taylor, Armitage & Eagles, Inc., New York. Tower Textile Mills Co., Toledo, Ohio. Turner, J. Spencer, Co., New York. Wellington, Sears & Co., Boston, Mass. Worcester Tire Fabric Co., Worcester, Mass. Tire Fabrics—Reclaimed. Goldsmith, A. J., Co., New York. Hibbs Rubber Co., Inc., The, Fort Worth, Texas. Tire Tape. American Cord & Webbing Co., New York. Kavanaugh, Geo. W., New York.	Yarns. Burr, Albert E., Co., New York. Lane, J. H., & Co., New York. Wellington, Sears & Co., Boston, Mass. Crude Rubber—Importers and Exporters. Alden's Successors, Ltd., New York. Astlett, H. A., & Co., New York. Baird Rubber & Trading Co., New York. Hagmeyer & Brunn, New York. Hankin, Geo., & Co., London, England. Henderson, F. R., & Co., New York. Hermann, Marsman & Co., Batavia, Java. D. E. I. Hirsch, Adolph, & Co., New York. Johnstone, J. T., & Co., New York. Mid East Trading Co., Singapore, S. S. Obalski, X. W., & Co., Inc., New York. Rogers-Pryatt Shellac Co., New York. Rubber Importers & Dealers Co., Inc., New York. Stern, Fred, & Co., New York. Stiles, William H., & Co., New York. Wilson Co., Inc., Charles T., New York. Crude Rubber Brokers. Brown, W. G., & Co., Cincinnati, Ohio. Chipman, R. L., New York. Duffy & Sears, New York. Dunbar, F. W., & Co., New York. Dunbar, J. Frank, Co., Inc., Boston, Mass. Hardy, Roger S., New York. Jacoby, Ernest, Boston, Mass. MacArthur & White, Inc., New York. Odell, Jas. E., Boston, Mass. Pardee, A. L., Akron, Ohio. Pell & Dumont, New York. Spencer-Hess, A. C., New York. Stedman, Arthur W., Inc., New York. Tallman, Albert V. W., New York. Wood, Charles F., New York. Crude Rubber—Washed and Dried. Acushnet Process Co., New Bedford, Mass. Continental Rubber Co., New York. Kuh, E. S., & Vark Co., New York. T. H. & B. Chemical Co., Hyde Park, Mass.	Butcher Mfg. Co., The, Akron, Ohio. Fillers. Butcher, L. H., Co., New York. Daigger, A., & Co., Chicago, Ill. Fuiper, Edward B., Trenton, N. J. Innis, Spelden & Co., Inc., New York. Smith Chemical & Color Co., New York. Tyler Patterson Co., Cleveland, Ohio. Fossil Flour—Infusorial Earth. Butcher, L. H., Co., New York. Daigger, A., & Co., Chicago, Ill. Fuiper, Edward B., Trenton, N. J. Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio. Holly-Wood Chemical Co., New York. Katsenbach & Bullock Co., New York. Scheel, William H., New York. Whittaker, Clark & Daniels, Inc., New York. Gilsonite. Daigger, A., & Co., Chicago, Ill. Holly-Wood Chemical Co., New York. Scheel, William H., New York. Wishnick-Tumpeur Chemical Co., Chicago, Ill. Graphite. Daigger, A., & Co., Chicago, Ill. Grund & Krause, Cleveland, Ohio. Innis, Spelden & Co., Inc., New York. Whittaker, Clark & Daniels, Inc., New York. Wishnick-Tumpeur Chemical Co., Chicago, Ill. Green Oxide of Chromium. Butcher, L. H., Co., New York. Daigger, A., & Co., Chicago, Ill. Grund & Krause, Cleveland, Ohio. Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio. Holly-Wood Chemical Co., New York. Innis, Spelden & Co., Inc., New York. Katsenbach & Bullock Co., New York. Laidlaw, Kelley & Co., Inc., New York. Reichard-Coulston, Inc., New York. Scheel, William H., New York. Tyler Patterson Co., Cleveland, Ohio. Waldo, E. M. & F., New York. Wishnick-Tumpeur Chemical Co., Chicago, Ill.

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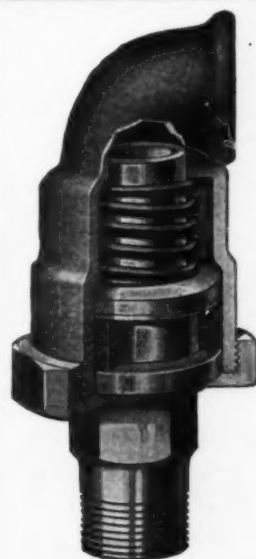
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Gutta-Percha.

Astlett, H. A., & Co., New York.
Chipman, R. L., New York.
Dunbar, J. Frank, Co., Inc., Boston, Mass.
Hankin, Geo., & Co., London, England.
Jacoby, Ernest, Boston, Mass.
Holly-Wood Chemical Co., New York.
Kuh, E. S., & Volk Co., New York.
Odell, Jas. E., Boston, Mass.
Pell & Dumont, New York.
Raw Products Co., N. Y.
Rubber Trading Co., New York—Boston.
Tallman, Albert V. W., New York.
Wood, Charles E., New York.

Hydro-Carbon Products.

Butcher, L. H., Co., New York.
Canfield Oil Co., The, Cleveland, Ohio.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Innis, Spelden & Co., Inc., New York City.
Katzbach & Bullock Co., New York.
Robertson, H. H., Co., Pittsburgh, Pa.
Scheel, William H., New York.
Vanderbilt, R. T., Co., New York.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Iron Oxide.

Butcher, L. H., Co., New York.
Cooper, Charles, & Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fulper, E. B., Trenton, N. J.
Grund & Krause, Cleveland, Ohio.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Katzbach & Bullock Co., New York.
Laidlaw, Kelley & Co., Inc., New York.
National Sales & Trading Co., Cleveland, Ohio.
Reichard-Coulston, Inc., New York.
Scheel, William H., New York.
Smith, Alfred, Ltd., New York.
Smith Chemical & Color Co., New York.
Tyler Patterson Co., Cleveland, Ohio.
Waldo, E. M. & F., New York.
Westmoreland Chemical & Color Co., Philadelphia, Pa.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Lampblack.

Binney & Smith Co., New York.
Butcher, L. H., Co., New York.
Cabot, Samuel, Boston, Mass.
Daigger, A., & Co., Chicago, Ill.
Grund & Krause, Cleveland, Ohio.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Innis, Spelden & Co., Inc., New York City.
Katzbach & Bullock Co., New York.
Laidlaw, Kelley & Co., Inc., New York.
Smith Chemical & Color Co., New York.
Smith, J. Lee, & Co., New York.
Tyler Patterson Co., Cleveland, Ohio.
Tyson Bros., Inc., Woodbridge, N. J.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Lead—Blue.

Lead—Sublimed White.

Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
Eagle-Picher Lead Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Katzbach & Bullock Co., New York.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Lime Flour.

Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Katzbach & Bullock Co., New York.
Laidlaw, Kelley & Co., Inc., New York.
National Sales & Trading Co., Cleveland, Ohio.
Scheel, William H., New York.
Smith Color & Chemical Co., New York.
Whittaker, Clark & Daniels, Inc., N. Y.

Litharge.

Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
du Pont, E. I., de Nemours & Co., New York.
Eagle-Picher Lead Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Innis, Spelden & Co., Inc., New York.
Katzbach & Bullock Co., New York.
Klipstein, A., & Co., New York City.
Laidlaw, Kelley & Co., Inc., New York.
Scheel, William H., New York.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Lithopone.

Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
du Pont, E. I., de Nemours & Co., New York.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Innis, Spelden & Co., Inc., New York.
Katzbach & Bullock Co., New York.
Klipstein, A., & Co., New York City.
Krebs Pigment & Chemical Co., The, Newport, Del.
Laidlaw, Kelley & Co., Inc., New York.
National Sales & Trading Co., Cleveland, Ohio.
New Jersey Zinc Co., New York.
Reichard-Coulston, Inc., New York.
Scheel, William H., New York.
Smith Chemical & Color Co., New York.
Tyler Patterson Co., Cleveland, Ohio.
Whittaker, Clark & Daniels, Inc., N. Y.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Magnesia.

Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
Frasar & Co., New York.
Fulper, Edward B., Trenton, N. J.
General Magnesite & Magnesia Co., Philadelphia, Pa.
Grund & Krause, Cleveland, Ohio.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Innis, Spelden & Co., Inc., New York.
Katzbach & Bullock Co., New York.

Magnesia—Continued.

Laidlaw, Kelley & Co., Inc., New York.
National Aniline & Chemical Co., New York.
National Sales & Trading Co., Cleveland, Ohio.
Reichard-Coulston, Inc., New York.
Scheel, William H., New York.
Smith, Alfred, Ltd., New York.
Stressen-Reuter & Hancock, Inc., Chicago, Ill.
Tyler Patterson Co., Cleveland, Ohio.
Whittaker, Clark & Daniels, Inc., N. Y.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Magnesite.

Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
Foote Mineral Co., Inc., Philadelphia, Pa.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Innis, Spelden & Co., Inc., New York.
Katzbach & Bullock Co., New York.
Tyler Patterson Co., Cleveland, Ohio.
Whittaker, Clark & Daniels, Inc., N. Y.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Magnesium.

General Metallic Oxides Co., New York.

Magnesium Oxide, Calcined.

Smith Chemical & Color Co., New York.

Marking and Stencil Ink.

Binney & Smith Co., New York, N. Y.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Mica.

Daigger, A., & Co., Chicago, Ill.
Holly-Wood Chemical Co., New York.
Scheel, William H., New York.
Tyler Patterson Co., Cleveland, Ohio.
Whittaker, Clark & Daniels, Inc., N. Y.

Mineral Rubber.

Barber Asphalt Paving Co., Philadelphia, Pa.
Canfield Oil Co., The, Cleveland, Ohio.
Daigger, A., & Co., Chicago, Ill.
Frasar & Co., New York.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Spelden & Co., Inc., New York.
Inter-Ocean Oil Co., New York.
Katzbach & Bullock Co., New York.
Pioneer Asphalt Co., Lawrenceville, Ill.
Rare Metal Products Co., Belleville, N. J.
Reese & Buckley, Inc., New York.
Robertson, H. H., Co., Pittsburgh, Pa.
Scheel, William H., New York.
Synthetic Products Co., Cleveland, Ohio.
Tyler Patterson Co., Cleveland, Ohio.
Vanderbilt, R. T., Co., New York.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Naphtha.

Daigger, A., & Co., Chicago, Ill.
du Pont, E. I., de Nemours & Co., New York.
Grund & Krause, Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Klipstein, A., & Co., New York.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Nitro Cake.

du Pont, E. I., de Nemours & Co., New York.

Oil Filters.

Burt Mfg. Co., The, Akron, Ohio.

Oils—Tar, Pine, Creosote, Rosin, Turpentine.

Daigger, A., & Co., Chicago, Ill.
Fulper, E. B., Trenton, N. J.
Holly-Wood Chemical Co., New York.
Laidlaw, Kelley & Co., Inc., New York.
National Rosin Oil & Size Co., New York.
Tyler Patterson Co., Cleveland, Ohio.
West Co., Inc., H. T., Boston.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Oils—Vegetable.

Daigger, A., & Co., Chicago, Ill.
Grund & Krause, Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
National Sales & Trading Co., Cleveland, Ohio.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Petrolatum.

Holly-Wood Chemical Co., New York.
Tyler Patterson Co., Cleveland, Ohio.
Vanderbilt, R. T., Co., New York.

Pigments.

Aluminum Flake Co., Akron, Ohio.
Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
du Pont, E. I., de Nemours & Co., New York City.
Eagle-Picher Lead Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Grund & Krause, Cleveland, Ohio.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Industrial Chemical Co., New York.
Innis, Spelden & Co., Inc., New York City.
Katzbach & Bullock Co., New York.
Klipstein, A., & Co., New York City.
Reichard-Coulston, Inc., New York.
Scheel, William H., New York.
Smith Chemical & Color Co., New York.
Tyler Patterson Co., Cleveland, Ohio.
Waldo, E. M. & F., New York.
Westmoreland Chemical & Color Co., Philadelphia, Pa.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Pine Tar.

Daigger, A., & Co., Chicago, Ill.
Grund & Krause, Cleveland, Ohio.
Holly-Wood Chemical Co., New York.
Katzbach & Bullock Co., New York.
Tyler Patterson Co., Cleveland, Ohio.
Vanderbilt, R. T., Co., New York.
West Co., H. T., Boston, Mass.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

Pitch.

Daigger, A., & Co., Chicago, Ill.
Katzbach & Bullock Co., New York.
National Rosin Oil & Size Co., New York.
Holly-Wood Chemical Co., New York.
Reese & Buckley, Inc., New York.
Scheel, William H., New York.
Tyler Patterson Co., Cleveland, Ohio.
Wishnick-Tumpeper Chemical Co., Chicago, Ill.

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"A wrapping, comprising a continuous strip wound spirally and transversely upon an article of ring form, and a wrapping strip applied adhesively, to the folds of said spiral strip to hold the same in fixed relation."

This patent is a continuation of original application filed March 23, 1911, Serial No. 618,520.

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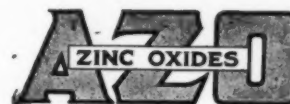
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 Whittaker, Clark & Daniels, Inc., New York.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Pumice Stone.

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 Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
 Whittaker, Clark & Daniels, Inc., New York.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

"Quaker" Whiting.

Vanderbilt, H. T., Co., New York.
 Whittaker, Clark & Daniels, Inc., New York.

Reclaimed Tire Fabric.

Hibbs Rubber Co., The, Fort Worth, Texas.

Reclaimed Rubber.

Appleton, F. H., & Son, Boston, Mass.
 Askam Rubber Co., Milford, Conn.
 Baird Rubber & Trading Co., New York—Boston, (Agent.)
 Brown, W. G., & Co., Cincinnati, Ohio.
 Clapp, E. H., Rubber Co., Boston, Mass.
 Continental Rubber Works, Erie, Pa.
 Dunbar, J. Frank, Co., Inc., Boston, Mass.
 McGorry, Philip, Trenton, N. J. (Agent.)
 Monatiquet Rubber Works Co., South Braintree, Mass.
 Neapara Rubber Co., Trenton, N. J.
 New Jersey Rub. Co., Lambertville, N. J.
 Northwestern Rubber Co., Liverpool, England, and Trenton, N. J.
 Odell, Jas. E., Boston, Mass. (Agent.)
 Pell & Dumont, New York (Agent.)
 Pequanoe Rubber Co., Butler, N. J.
 Philadelphia Rubber Works, Philadelphia, Pa.
 Phoenix Rubber Co., Akron, Ohio.
 Raymond Rubber Co., Titusville, N. J.
 Rubber Regenerating Co., Naugatuck, Conn.
 Somerset Rubber Reclaiming Works, New Brunswick, N. J.
 Stockton Rubber Co., Stockton, N. J.
 T. H. & B. Chemical Co., Hyde Park, Mass.
 U. S. Rubber Reclaiming Co., Inc., N. Y.
 Vulcan Recovery Co., Trenton, N. J.

Red Oxide.

Rinney & Smith Co., New York.
 Butcher, L. H., Co., New York.
 Coulston, J. W., & Co., New York.

Red Oxide—Continued.

Daigger, A., & Co., Chicago, Ill.
 Fulper, Edward B., Trenton, N. J.
 Grund & Krause, Cleveland, Ohio.
 Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
 Holly-Wood Chemical Co., New York.
 Innis, Spelden & Co., Inc., New York City.
 Katzenbach & Bullock Co., New York.
 Laidlaw, Kelley & Co., Inc., New York.
 National Sales & Trading Co., Cleveland, Ohio.
 Reichard-Coulston, Inc., New York.
 Scheel, William H., New York.
 Tyler Patterson Co., Cleveland, Ohio.
 Tyson Bros., Inc., Woodbridge, N. J.
 Waldo, E. M. & F., New York.
 Westmoreland Chemical & Color Co., Philadelphia, Pa.
 Whittaker, Clark & Daniels, Inc., New York.
 Williams, C. K., & Co., Easton, Pa.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Resin.

Daigger, A., & Co., Chicago, Ill.
 Scheel, William H., New York.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Rosin.

Daigger, A., & Co., Chicago, Ill.
 Grund & Krause, Cleveland, Ohio.
 Holly-Wood Chemical Co., New York.
 Katzenbach & Bullock Co., New York.
 Laidlaw, Kelley & Co., Inc., New York.
 Tyler Patterson Co., Cleveland, Ohio.
 West, H. T., Co., Boston, Mass.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Rotten Stone.

Daigger, A., & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.

Rubber Flux.

Robertson Paint & Varnish Co., Cleveland, Ohio.
 Synthetic Products Co., Cleveland, Ohio.

Rubber Makers' White.

Daigger, A., & Co., Chicago, Ill.
 du Pont, E. I., de Nemours & Co., New York City.
 Katzenbach & Bullock Co., New York.
 Smith Chemical & Color Co., New York.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Rubber Substitutes.

Ashley, T. C., & Co., Boston, Mass.
 Butcher, L. H., Co., New York.
 Carter Bell Mfg. Co., New York.
 Daigger, A., & Co., Chicago, Ill.

Rubber Substitutes—Continued.

Fulper, Edward B., Trenton, N. J.
 Holly-Wood Chemical Co., New York.
 Jacoby, Ernest, Boston, Mass.
 Katzenbach & Bullock Co., New York.
 Scheel, Wm. H., New York.
 Smith, Alfred, Ltd., New York.
 Smith Chemical & Color Co., New York.
 Stamford Rubber Supply Co., Stamford, Conn.
 T. H. & B. Chemical Co., Hyde Park, Mass.
 Tyler Patterson Co., Cleveland, Ohio.
 Typke & King, London, England.
 Tyson Bros., Inc., Woodbridge, N. J.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Scrap Rubber.

Bers, E., & Co., Philadelphia, Pa.
 Birkenstein & Sons, S., Chicago, Ill.
 Chaffin, Joseph, New York.
 Cummings & Sons, Wm. H., New York.
 Feinberg Co., David, Chelsea, Mass.
 Harrison, S. B., & Co., London, England.
 Liebsteln, T. B., Newark, N. J.
 McGorry, Philip, Trenton, N. J.
 Muehlstein & Co., H., New York.
 Norton & Co., M., Charlestown, Mass.
 Schurmann, J., London, England.
 Trenton Scrap Rubber Supply Co., Trenton, N. J.
 Weber, Hermann, New York.

Silica.

Daigger, A., & Co., Chicago, Ill.
 Holly-Wood Chemical Co., New York.
 Innis, Spelden & Co., Inc., New York City.
 Katzenbach & Bullock Co., New York.
 Smith Chemical & Color Co., New York.
 Tamms Silica Co., Chicago, Ill.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Soapstone.

Rinney & Smith Co., New York.
 Butcher, L. H., Co., New York.
 Daigger, A., & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
 Holly-Wood Chemical Co., New York.
 Katzenbach & Bullock Co., New York.
 Laidlaw, Kelley & Co., Inc., New York.
 National Sales & Trading Co., Cleveland, Ohio.
 Scheel, William H., New York.
 Whittaker, Clark & Daniels, Inc., New York.
 Williams, C. K., & Co., Easton, Pa.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Steam and Hot Water Pipe Insulation.

Ric-wil Co., Cleveland, Ohio.

Sulphur.

Battelle & Renwick, New York.
 Butcher, L. H., Co., New York.
 Daigger, A., & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
 Holly-Wood Chemical Co., The, New York.
 Innis, Spelden & Co., Inc., New York City.
 Katzenbach & Bullock Co., New York.
 Laidlaw, Kelley & Co., Inc., New York.
 National Sales & Trading Co., Cleveland, Ohio.
 Niagara Sprayer Co., Middleport, N. Y.
 Rubber Chemical Co., Ltd., London, England.
 Southern Acid & Sulphur Co., St. Louis, Missouri.
 Tyler Patterson Co., Cleveland, Ohio.
 White, T. & S. C., Co., New York.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Sulphur Chloride.

Ashley, T. C., & Co., Boston, Mass.
 Butcher, L. H., Co., New York.
 Carter Bell Mfg. Co., New York.
 Daigger, A., & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
 Holly-Wood Chemical Co., The, New York.
 Innis, Spelden & Co., Inc., New York City.
 Katzenbach & Bullock Co., New York.
 Laidlaw, Kelley & Co., Inc., New York.
 Scheel, William H., New York.
 Stamford Rubber Supply Co., Stamford, Conn.
 T. H. & B. Chemical Co., Hyde Park, Mass.
 Tyler Patterson Co., Cleveland, Ohio.
 Tyson Bros., Inc., Woodbridge, N. J.
 Wishnick-Tumpeur Chemical Co., Chicago, Ill.

Talc.

Rinney & Smith Co., New York.
 Butcher, L. H., Co., New York.
 Daigger, A., & Co., Chicago, Ill.
 Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
 Holly-Wood Chemical Co., The, New York.
 Innis, Spelden & Co., Inc., New York City.
 Katzenbach & Bullock Co., New York.
 Laidlaw, Kelley & Co., Inc., New York.
 National Sales & Trading Co., Cleveland, Ohio.
 Reichard-Coulston, Inc., New York.
 Scheel, William H., New York.
 Smith Chemical & Color Co., New York.
 Smith, J. Lee, & Co., New York.
 Tyler Patterson Co., Cleveland, Ohio.

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Talc—Continued.

Vanderbilt, R. T., Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeier Chemical Co., Chicago, Ill.

Talc Cans.

St. Louis Paper Can & Tube Co., St. Louis, Mo.

Tripoli Flour.

American-Tripoli Co., Seneca, Mo.
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Holly-Wood Chemical Co., New York City.
Innis, Spelden & Co., Inc., New York City.
Katsenbach & Bullock Co., New York.
Scheel, William H., New York.
Wishnick-Tumpeier Chemical Co., Chicago, Ill.

Ventilators.

Burt Mfg. Co., The, Akron, Ohio.

Wax

Daigger, A., & Co., Chicago, Ill.
Dunbar, J. Frank, Co., Inc., Boston, Mass.
Holly-Wood Chemical Co., New York City.
Innis, Spelden & Co., Inc., New York City.
Reese & Buckley, Inc., New York.
Scheel, William H., New York.
Smith, Alfred, Ltd., New York.
Vanderbilt, R. T., Co., New York.
West, H. T., Co., Boston, Mass.

Wax—Continued.

Wishnick-Tumpeier Chemical Co., Chicago, Ill.

White Lead.

Butcher, L. H., Co., New York.
Daigger, A., & Co., New York.
Eagle-Fisher Lead Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Katsenbach & Bullock Co., New York.
Wishnick-Tumpeier Chemical Co., Chicago, Ill.

Whiting.

Butcher, L. H., Co., New York.
Columbia Products Co., Cleveland, Ohio.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Industrial Chemical Co., New York.
Holly-Wood Chemical Co., New York.
Katsenbach & Bullock Co., New York.
Laidlaw, Kelley & Co., Inc., New York.
National Sales & Trading Co., Cleveland, Ohio.
Reichard-Coulston, Inc., New York.
Smith Chemical & Color Co., New York.
Scheel, William H., New York.
Solvay Process Co., New York.
Taintor, H. F., Mfg. Co., New York.
Tammes Silica Co., Chicago, Ill.
Tyler Patterson Co., Cleveland, Ohio.
Tyson Bros., Inc., Woodbridge, N. J.
Vanderbilt, R. T., & Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wing & Evans, Inc., Detroit, Mich.
Wishnick-Tumpeier Chemical Co., Chicago, Ill.

Wood Flour.

Daigger, A., & Co., Chicago, Ill.
Industrial Chemical Co., New York.
Wishnick-Tumpeier Chemical Co., Chicago, Ill.

Zinc, Oxide of.

American Zinc, Lead & Smelting Co., New York.

Butcher, L. H., Co., New York.
Cooper, Charles, & Co., New York.
Daigger, A., & Co., Chicago, Ill.
Frazier & Co., New York.
Fulper, Edward B., Trenton, N. J.
Grund & Krause, Cleveland, Ohio.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Holly-Wood Chemical Co., New York City.

Innis, Spelden & Co., Inc., New York City.

Katsenbach & Bullock Co., New York.
Klipstein, A., & Co., New York.
Laidlaw, Kelley & Co., Inc., New York.
Mineral Point Zinc Co., Chicago, Ill.
National Aniline & Chemical Co., New York.
National Sales & Trading Co., Cleveland, Ohio.

New Jersey Zinc Co., New York.
Reichard-Coulston, Inc., New York.
Scheel, William H., New York.
Smith, J. Lee, & Co., New York.
Tyler Patterson Co., Cleveland, Ohio.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeier Chemical Co., Chicago, Ill.

Zinc Substitute.

Butcher, L. H., Co., New York.
du Pont, E. I., de Nemours & Co., New York City.
Katsenbach & Bullock Co., New York.
Scheel, William H., New York.
Smith Chemical & Color Co., New York.
Tyler Patterson Co., Cleveland, Ohio.

MISCELLANEOUS

Advertising Agency.

Akron Advertising Agency Co., Akron, Ohio.

Banks.

First National Bank of Boston, Mass.
Kidder, Peabody & Co., New York.

Brass Fittings.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Schrader's, A., Son, Inc., New York.

Consulting Rubber Chemists.

Boerstler, Elton S., Denver, Colo.
Maywald, Dr. P. J., Newark, N. J.
Weber, Dr. Lothar E., Boston, Mass.

Consulting Rubber Engineers.

Dunbar, Wilmer, Greenberg, Pa.
Seward, Thomas J., Co., New York.

Consulting Rubber Technologist.

Norris, Webster, Brooklyn, N. Y.

Cotton Lands.

Stuart, W. A., Los Angeles, Calif.

Factory Sites.

St. Louis Chamber of Commerce, St. Louis, Mo.

Forwarders and Shippers.

Williams Shipping Agency, Inc., N. Y.

Patent Attorney.

Boyle, John, Jr., Washington, D. C.

Rubber Plant Engineers

Akron Engineering Co., The, Akron, O.
Associated Engineers Co., The, Cleveland, O.

London Co., Chicago, Ill.

Consulting Co., Cincinnati, Ohio.

Osborn Engineering Co., The, Cleveland, Ohio.

Rubber Engineering Co., Akron, Ohio.

Seward, Thomas J., Co., New York.

Sealing Tape.

Liberty Paper Co., New York.

Submarine Outfits.

Hodgman Rubber Co., New York.
Schrader's Son, Inc., A., New York.

Wilckes-Martin-Wilckes Co.

LAMP BLACK


135 William Street

New York City

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ASBESTOS PROTECTED

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Therefore Meet Every Claim That Can Be Made for the Best Tires Manufactured

**The Exclusive Patented Asbestos Breaker Strip
Is Used in All Perfection Tires**



Perfection Standard Construction Fabric Tire is a 6000 mile tire that meets competition and price in every respect. The tread is a combination of the Popular Rib-Tread and non-Skid design, possessing all the desirable qualities of both. It meets the popular call for Service at a Moderate Cost.

Perfection 8000 Mile Special is a product without Price Competition for a similarly constructed casing. It is an Extra Ply fabric tire that will always give 8000 miles or more of Service. This tire fills a long felt want as it appeals to the Buyer that wants service and mileage but does not want to pay "Cord Construction Prices." It combines Quality and Mileage at a Price. (Made only in sizes up to 34x4, inclusive.)

Perfection Cord at the same prices as other leading makes is the Perfection Super-Tire—full Over-Size—only the Best Cord Fabric obtainable being used in its Hand Construction. While it is adjusted on an 8000 mile basis, we only refrained from introducing the tire on a 10,000 or 12,000 mile adjustment basis, because we felt, as do other tire manufacturers, that mileage guarantee will soon be a thing of the past, and Quality and Service alone will be the purchasers' demand.



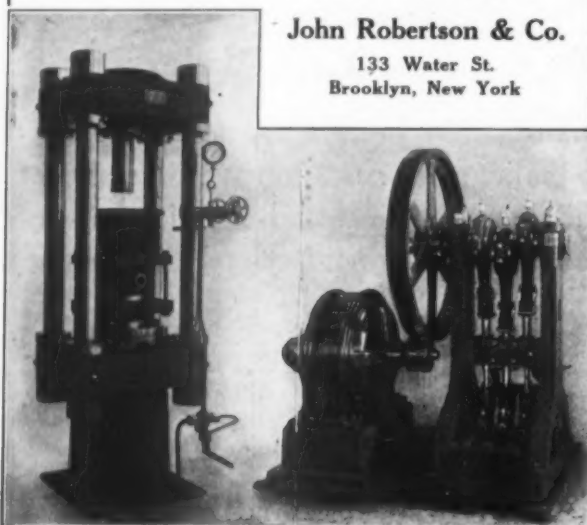
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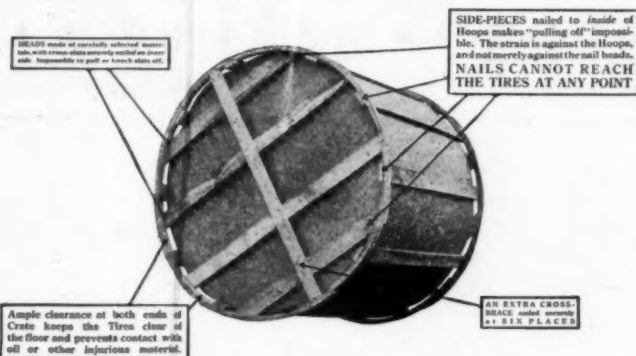
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This is what S-A Crate users say.

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